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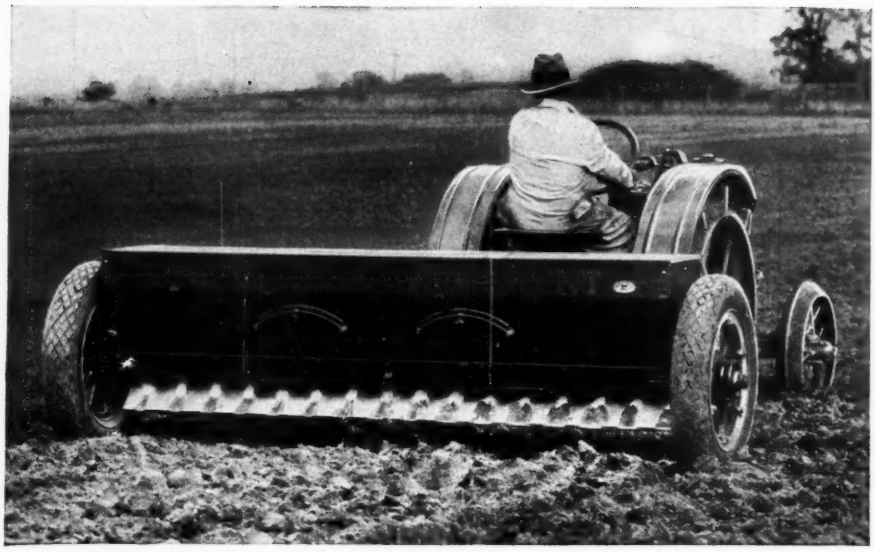

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The Whole Truth—Not Selected Truth

R. H. STINCHFIELD, *Editor*
Editorial Offices: Investment Bldg., Washington, D. C.

VOLUME XXI NUMBER THREE

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American Potash Institute, Inc.
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ALOOF AND ALONE, AN AGED SENTINEL STILL KEEPS WATCH.

Better Crops with PLANT FOOD

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VOL. XXI WASHINGTON, D. C., JANUARY 1937 No. 3

Jeff changes liabilities into assets. . .

Inventory

Jeff McDermid

IS IT not time for American agriculture to take a shelf-to-shelf inventory of its rich possessions, like the shrewd country tradesman? After that, is it not appropriate for farmers to do a little constructive advertising of the best occupational assets they discover? Would that help to overcome some of the adverse ideas which the other three-fourths of America entertain about our maligned and misjudged rural minority?

If not, do we go on record in 1937 as inclined to discourage all attempts to make country living attractive or to point out its frequent compensations against a life in town—on the grounds that there are too many ill-fitted folks a-farming today, and that our rural security depends on a diminished movement countryward and a gradual reduction of the food surplus? Frankly, I am sometimes unable to tell to which policy organized agriculture and its spokesmen are directed.

Of course, it seems to me that it is the saner plan to defend and to extol the solid virtues and homely comforts of agriculture as a profession, rather than to join in a chorus which sings lamentations and doxologies. In this course I would reject the untrue and overly sentimental, because facts and proof are sufficient without them.

Further, it seems to me a far better plan to help build up a more durable and attractive industrial plant in America, with its members in a greater degree of social and economic peace

and security. This at least is somewhat like helping a neighbor build a better house so that the taxes and interest you pay on yours may be less burdensome in true relation to future community values. We must remember that the heaviest threat to an overdone farm profession is a sinking and a wavering industrial situation. For that combines not only to build up fierce and lamentable agrarian competition, but it cuts the ground under the steady consumption of food at remunerative prices to farmers.

Misconceptions about farming largely arise from hearsay, political distortion, or from the tales of the pioneers. That is, the old independence and bravery of tradition attributed to the pioneers in art, song, literature, and history has all been tangled up in modern minds with messy discomforts like poor roads, bad schools, makeshift living, pancakes at every meal, and the outdoor toilet in zero weather. In spite of the auto era of wide travel, much of this misunderstanding is rampant on the boulevards, and why not? Just test it yourself in regard to your metropolitan impressions.

WHEN we farmers go to the big city, do we not judge hastily by exceptions or extremes? We ride the elevated train to the Chicago stock show on the same day that the elite of the gold coast occupy the boxes for the horse show. We return home with the conviction that cities consist entirely of dreary slums and ash heaps on the rim of a realm of wasteful luxury and prodigality. It's the big middle average that we miss.

Popular notions need overhauling in respect to the better type of country dwellers. It is as though one came to a big red barn, the kind which often has the whisky or tobacco signs on it, and we read the following painted announcement:

"Why Respect Agriculture? It is (1) lonely and secluded; (2) uncultured and narrow; (3) hazardous and uncomfortable; and (4) querulous and dissatisfied."

THAT kind of philosophy has been emblazoned abroad on many a platform by alleged farm supporters for three decades or more. It is no wonder then that many folks prefer to utilize the twilight period as the "cocktail hour" in some gaudy club instead of the "milking hour" on the farm. It explains why the majority choose the alarm clock in the flat to the rooster in the sticks. But worse than any of these, it is the kind of mental poison which breeds maudlin sympathy or amused contempt—either of which are not sought by upstanding farmers. To counteract this we require an aroused army of de-bunkers. And some of the first de-bunking must be performed on their leaders, sad to relate. All we can do is to start the crusade and let the fellows with local details add the finishing touches everywhere. So, taking the above screed apart in due order, let us do some dissecting. Can we scrape some of the red paint off that barn? Give us a lift on the ladder and help us do a clean job without any whitewashing! If whisky and tobacco signs don't belong there, neither does the other one.

First, let's sponge out "lonely and secluded." I do this over the protest of statisticians who bemoan the actual dearth of radio sets in some bucolic realms, and despite the hullabaloo for more and better side roads. For no citizen of our ken is more thoroughly open to constant inspection and uninvited visitation than the average farmer; and his premises are about as secluded as the w. k. road to ruin. There are more busy agents and pompous agencies cluttering up the farm scenery than there are newspaper reporters pestering the Duke of Windsor.

Here comes the census taker who

wants to file with the blessed government all known and imagined data which will help some congressman give his speech a rural flavor. Close on his heels arrives the town assessor, hunting for tangibles to tax. Next friend wife gets a visit from the county nurse to check up on the fresh air intakes for sleeping kiddies, fol-

lowed by the home demonstration agent, who inquires feelingly about the vitamin dietary served to hired men.

Here is the insurance man, ready to write a dual endowment policy for the twins or sign you up for silo coverage. If he already has your premises insured, he insists on peering around from cellar to attic, pointing out hazards and making mother angry because the beds are not made. Not to be outdone on vital statistics, the banker who holds the mortgage swerves into the yard and wants to take an inventory of the exact status of his collateral; and he also desires to see evidence of your systematic accounting methods.

The rural school supervisor drops in for a meal and a lengthy dissertation on the duties of parents and electors. Presently the gate clicks and the sterling remedy and liniment gentleman bursts in to find out if your stock of "heave halt" and "bunion buster" is low, or if mother's vanilla extract needs replenishing. Not far behind him we see the dusty brush man and sudsy soap agent running a marathon to catch the housewife unprepared.

The R. F. D. inspector stops long enough to point out that you need a new steel mail box big enough to hold all those confounded catalogs. The college sends the weed inspector to shame you for leaving so much potential misery along the roadside. In a different mood, the county agent appears at the head of a caravan of farmers from the next county to show them your alfalfa. Suddenly from nowhere the county soil conservation gang climb over the fence with measuring wheels and scrolls of foolscap, anxious to get all the final proof to finish Docket No. A-1, Series 65. That takes two days more. When they depart another fellow comes to make a soil map and bores you almost as much as he does the soil.

AND from here we could run on and on, although time is too precious to delay further, even if we miss the vet who punches holes in good hides for the area test, the gent who collects wild flower specimens for the museum, the geologist hunting minerals, the subscription solicitor with the horse blanket premiums, and the expert who thinks he can cull hens. And so as evening settles down, the family retires without tuning in the amplifier, having had plenty of enough for one day. Who said "pity the pioneers"?

Second, we smear out the words "uncultured and narrow." There are still some folks who regard the countryman and his relatives as uncouth bumpkins in the aggregate, although they do sometimes admit that a flicker of genius often glows from the squash centers and accidentally yields a Grant Wood or a Hamlin Garland.

If they took a regular assay, however, of these fruitful and famous stars of art and literature and then weighed the "pay dirt" in proportion to the population strata from which it

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Permanent Grassland Has Cash Value

By J. W. White

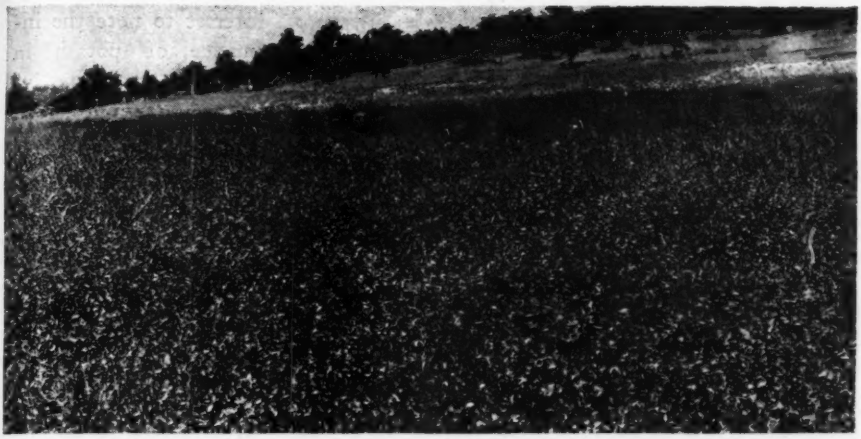
Pennsylvania Agricultural Experiment Station, State College, Pennsylvania

THE author and several of his associates recently made an inspection of the various methods proposed in Pennsylvania for the control of soil erosion. It is not the purpose of this article to discuss the merits of the various systems introduced, for most of you are familiar with such projects in our eastern states. The phase of the control measure which immediately attracted my attention was the paramount role to be played by grass sod, including both temporary grass strips and permanent grassland to be established on the steep hillsides.

In the long-established agricultural sections, such as southeastern Pennsylvania, where a more or less definite field rotation system has been handed down from father to son, the new order of things may seem at first a radical and unnecessary interference with a long-established farming system. In the more prosperous farming area of Lancaster County, permanent pastures play a minor part, for grazing is confined largely to the fields from which clover is harvested in the early summer. Here dry-lot feeding also has long been established. These farmers believe that their fertile fields bring more profitable returns in a short rotation, and that the tillable land is too valuable for permanent pasture. Little do they realize that, like a thief in the night, sheet erosion is gradually, perhaps, but surely skimming the cream from the surface of their now fertile fields.

It seems apropos then to point out

Daisies do sometimes tell! A poor, sour, abandoned field on Dekalb soil glorified by Mother Nature in her successful attempt to hide the neglect of her tenant.



From white daisies to red clover. A new up-to-date tenant moved on this farm, and he cared naught for "Saying It with Flowers." So he plowed down the daisies, harrowed the land, applied lime and PK fertilizers, and seeded the field to clover. The change in the landscape pleased him and all who passed along his way, and following the clover came fields of ripened grain.

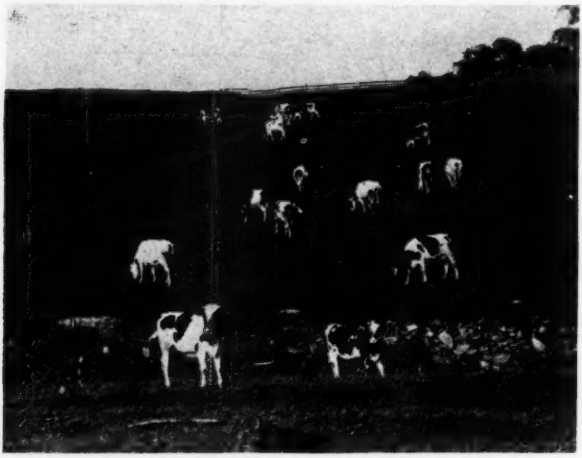
at this time the value of permanent grassland aside from the standpoint of erosion control. Such information of a definite nature will place into the hands of those confronted with these problems specific arguments that may aid them in establishing the several schemes of soil conservation involving the use of grass.

No farmer need be sold the idea that soil organic matter is the key to the fertility of his fields. He knows that his soil, dark brown in color, is more friable and mellow and requires less labor to prepare than that field, perhaps on the hillside, where soil is yellow and clods remain behind in the wake of the harrow. He may know why this field is inferior, but does he know how to restore it? Applications of barnyard manure, growing of green manure in the nature of cover crops and catch crops, plowed under say, for corn, will help, but even these measures are not enough. Green manures and barnyard manure may aid in the maintenance of soil organic matter, but so long as cultural practices of plowing, harrowing, and cultivation are followed, the level of organic matter will not be permanently raised.

There is only one economical way of actually building up soil organic matter and that is by means of permanent sod in the nature of a well-fertilized meadow or pasture. On fields already fertile, keep them so by the systematic use of green manure crops and animal manure. To build up the organic matter and restore the life of that worn-out, run-down field, the farmer must resort to more heroic measures.

In 1916, the writer began a series of experiments on Dekalb soil, on exceedingly poor, run-down, mountain land. On one field a 4-year grain rotation was established, and on an adjoining area a Kentucky bluegrass

	Ky. Bluegrass Pasture Fertilizer Treatment				Rotation Fertilizer Treatment			
	Check	P	PK	PKN	Check	P	PK	PKN
Organic Matter	11.9	21.5	48.5	28.1	12.0	16.2	17.1	21.8
Nitrogen	10.5	17.1	50.5	32.3	15.4	18.6	21.3	17.1



Better for the cow than the plow. The program of soil conservation in relation to soil erosion control emphasizes the importance of permanent grassland for hillsides as a substitute for crops in a rotation system. On cultivated hillsides sheet erosion like a thief in the night, skims the very cream from the surface soil. "Save the surface and you save it all."

pasture was started. Each field contained 10 plots, and the two experiments were fertilized and limed in like manner. At the end of 8 years each plot of the two systems was sampled and the soils analyzed for organic matter and total nitrogen. The following summary shows the gain in organic matter and nitrogen during the 8-year period expressed in percentage of increase over the original soils.

With the exception of the untreated (check) plot the soils under permanent grass showed a greater gain in relation to each treatment. It is of interest to note the influence of potash in bringing about the increased accumulation of nitrogen and organic matter especially in the bluegrass pasture.

Further evidence of the soil-building value of grassland is furnished by the Jordan Soil Fertility Plots. The division strips which separate these old plots have been in permanent sod since 1867. In 1922 the writer made a study of the organic matter and nitrogen content of the grass division strips and also the plot soils. From 1868 to 1880, inclusive, the plots were used as miscellaneous experiments. Since that time a definite field plot experiment has been in progress. It became possible, therefore, to determine the effects of a permanent grass sod and a rotation system in the maintenance of soil organic matter and nitrogen for a period of 55 years (1867-1922). The following table shows the results secured in relation to various plot treatments compared to the unfertilized grass strips.

These data present conclusive evi-

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POUNDS PER ACRE OF SOIL ORGANIC MATTER AND NITROGEN FOUND AT THE END OF 55 YEARS IN THE SOILS OF THE TWO SYSTEMS OF SOIL MANAGEMENT.

Biennial Plot Treatment	Untreated Grass Strips		Plots in Rotation	
	Organic Matter	Total Nitrogen	Organic Matter	Total Nitrogen
P (plot 3)	65,791	3,054	49,982	2,284
PK (plot 15)	78,515	3,740	61,971	2,964
NPK (plot 27)	79,390	3,830	59,630	2,880
6 tons manure (plot 16)	85,872	3,980	72,629	3,330
6 tons manure + L (plot 22)	90,745	4,290	78,480	3,690
Check (plot 14)	75,646	3,630	55,478	2,470
Average	79,327	3,754	63,028	2,936
Increase over plot soils	16,299	818		

P = 48 lbs. P_2O_5; K = 100 lbs. K_2O; N = 48 lbs. N. as nitrate of soda.

Excess Soluble Salts In Greenhouse Soils

By C. T. Gregory

Purdue University Agricultural Extension Department, Lafayette, Indiana

ABOUT 10 years ago greenhouse gardeners began experiencing a puzzling trouble in their lettuce. The plants simply would not grow in some spots in the greenhouses. Sometimes these areas were near the walks, sometimes in the back of the beds near the outside wall, or they might be located in the middle of the beds. In one house these areas would be small and in another house rather large. But, they were always quite irregular in size and shape.

The plants in these spots were always stunted, but not always to the same degree. Some plants never seemed to increase in size after they were transplanted into the beds. Such plants were dark green in color, and the leaves were thick and tough. In practically every case the plants did not die. To make this situation more confusing there would be plants in such spots that were apparently quite normal in size and color, growing 7 or 8 inches from the little dwarfed runts.

These small stunted plants were studied carefully in an attempt to determine the nature of the disease causing this trouble. The roots and underground stems were brown or had a superficial olive brown color. But no fungus or bacteria could be associated with the trouble, and nematodes were not present. This led us to the conclusion that it must be some unbalanced condition in the soil.

Soil Symptoms

The late Professor S. D. Connor suggested that it might be due to high concentrations of soluble salts. He made water extracts of soil samples taken from good areas and poor areas and determined the percentage of soluble salts in each case. Immediately the nature of the problem revealed itself. In every case the soil samples taken beneath the poor, stunted lettuce contained from two to seven times as much soluble salts as the soil

Inspecting stunted lettuce which resulted from excess soluble salts.

taken beneath good plants. It was interesting to find that the soil taken beneath a poor plant compared with soil taken beneath a good plant, not over 8 inches away, would show the same differences in the soluble salt content. This was the beginning of the study of excess soluble salts in greenhouse soil. Since that time we have found several different plant symptoms of this condition in vegetables and flowers.

Professor Connor's studies have led us to believe that a rich garden or greenhouse soil will contain about .15 per cent to .20 per cent of soluble salts. When the soluble salt content mounts to .25 per cent, some manifestation of trouble may be expected. Above this point we find greater and greater exaggerations of the slow growth and generally stunted condition of the plants associated with soluble salts.

Another symptom of this trouble in the soil is the appearance of a white crust, as the surface soil dries out. On soils where injury is occurring to the plants, this crust will usually be rather thick and may spread completely over the surface. A few such white areas may appear on soils where the soluble salts condition has not yet reached injurious proportions. Such a white crust should be looked upon as a signal of danger creeping up in the soil.

Vegetable Symptoms

I have already mentioned the stunting of lettuce plants as one symptom of the trouble. In practically every case we may say that soluble salt has not caused death. The plants simply refuse to grow, or, as the gardeners say, they seem to get smaller all the time. However, this does not mean that the concentration of the salts cannot become great enough to actually cause death. We had one case from a greenhouse in Illinois where the grower complained that nothing would live in the soil. The soluble salt content in this case was considerably more than 1.0 per cent.

Ordinarily tomatoes and cucumbers will grow normally in soils where lettuce is stunted, but I have found cases where both of these crops were stunted by soluble salts. Radishes also seem to be more tolerant than lettuce.

Flower Symptoms

Among flowers we find symptoms of injury not usually found in vegetables. Chrysanthemums may be seriously stunted, with their leaves exhibiting chlorosis. Sometimes this chlorosis is general, and at other times it is interveinal in the center of the leaf. The flowers produced will be just about normal in color but will be smaller in size and on shorter stems than the normal flowers of the same variety. Some may say that this could be a manifestation of phosphate deficiency, but heavy watering will correct such trouble if used early in the life of the plant.

Primroses have shown all the symptoms of dwarfed leaves with all the chlorotic conditions from complete bleaching to a distinct interveinal chlorosis. These plants sometimes have almost normally developed lower leaves, with a rosetting and yellowing of the center leaves. Sometimes poor, depauperated flower clusters were formed, but ordinarily no flowers were developed. Plant-tissue tests made by the Thornton method revealed excessively high amounts of nitrate, phosphate, and potash. In one case where a grower had 400 primroses in this condition, he was told to water heavily and frequently and to set the pots up so as to insure thorough drainage. He did this, and 300 of the plants recovered, made a good growth, and were sold at Christmas. The remaining 100 recovered later, and in the spring were making a normal

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Better Sweet Potatoes For South Carolina

By E. H. Rawl

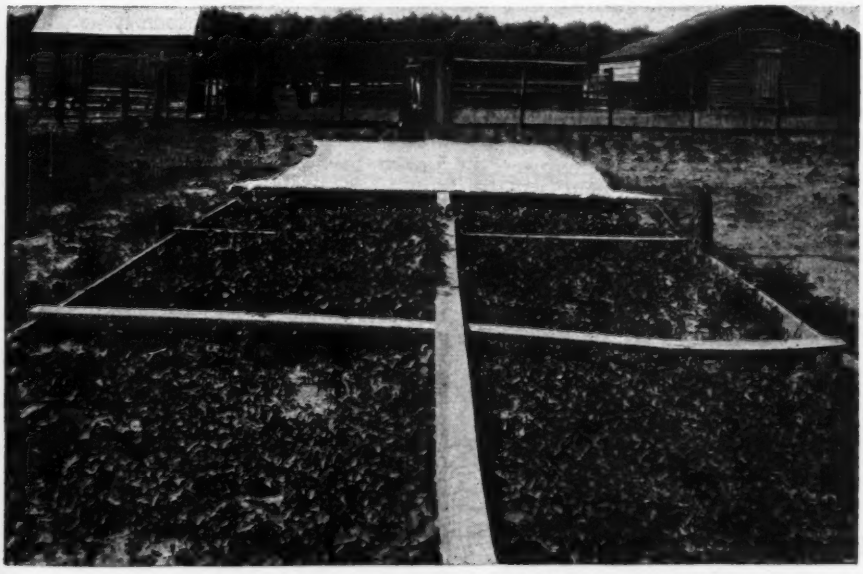
Extension Horticulturist, Clemson College, South Carolina

EXPERIMENTAL work and repeated demonstrations in South Carolina have clearly shown that fertilizers carrying a high percentage of potash are essential in producing a high and profitable yield of U. S. No. 1 sweet potatoes.

The sweet potato is important in South Carolina, rating fifth among crops in the Palmetto state. From 1926 to 1935 inclusive, an average of 51,600 acres was devoted to sweet spuds. From a commercial standpoint, the sweet potato in South Carolina has not been developed to its fullest extent, although growers each year are becoming more cognizant of its value as a money crop. However, as a local market crop, it has been and still is of much importance, and as a food and feed crop for the farms, it occupies a prominent position.

At present about 300 carloads are the maximum annual shipment to northern markets, and in recent years the out-of-state movement has been much lighter. From the long-time viewpoint there seems to be a place for a great development of this industry.

Stimulated by the sweet potato contests some years ago, considerable interest was manifested in the development of this crop commercially. At



A section of fire-heated hotbed showing an abundance of early plants.

the present time renewed interest is being shown. For instance, a carload of copper-colored Porto Rican strain, which was developed by the Louisiana Experiment Station, was placed by the Clemson College Extension Service and the South Carolina Sweet Potato Association in the spring of 1936 among 287 growers in 19 counties. From this foundation stock an ample supply of seed stock will be produced for further distribution. From reports already received, the yields from the Louisiana strain of Porto Rican Potato have proven far superior to any previously produced in South Carolina.

Sweet potatoes when handled properly will have to be considered as one of the most highly specialized truck crops. In the past they have been regarded as a crop which could be grown without a great deal of effort. But, as a result of this attitude, the quality offered generally has not been sufficiently high to establish a reputation. With the renewed interest, considerable attention is being given by the State Extension Service in aiding growers to establish the crop as a profitable enterprise.

A great deal of the specific information being used in South Carolina is based not only on experimental work but on the results of sweet potato contests. Data from the contests show that the majority of the growers in the high yield group followed the recommendations as to close spacing, early planting, and the use of 800 to 1,000 pounds of fertilizer per acre carrying 8 to 10 per cent potash, 8 per cent phosphoric acid, and 3 per cent ammonia. The contests further showed that the low yield group failed to abide by these recommendations.

In Bulletin 66, published by the Virginia Truck Experiment Station, further information on proper fertilization of sweet potatoes is found. In this publication, written by H. H. Zimmerley, it is stated that experiments on sweet potato fertilizers, using the big-stemmed Jersey variety, show that over a period of years the percentage of prime sweets was greatest on the plots fertilized with 3-3-15 (NPK) mixture, and the lowest on the area fertilized with a 3-15-3 (NPK) mixture. These investigations indicate that a good sweet potato fertilizer mixture should furnish approximately 30 pounds of ammonia, 30 pounds of phosphoric acid, and 150 pounds of potash per acre.

Experimental work on the fertilization of this crop at the Maryland and New Jersey Agricultural Experimental Stations furnished information similar to that reported by Zimmerly, to wit, the importance of a relatively high potash content in the fertilizer.

Successful South Carolina growers have found that the mixture below makes an excellent sweet potato

Pounds of material	Pounds of plant food and analysis of mixture		
	Phosphoric acid	Ammonia	Potash
944 Lbs. Acid phosphate (16%)	151.0	0.0	0.0
300 Lbs. Cottonseed meal (3-7-2%'s)	9.0	21.0	6.0
100 Lbs. Sulphate ammonia (25%)	0.0	25.0	0.0
72 Lbs. Nitrate of soda (19.45%)	0.0	14.0	0.0
200 Lbs. Sulphate of potash (50%)	0.0	0.0	100.0
188 Lbs. Muriate of potash (50%)	0.0	0.0	94.0
196 Lbs. Dolomitic limestone	0.0	0.0	0.0
2000 Lbs. = 20	160.0	60.0	200.0
	8	3	10

* For all practical purposes, even weights of fertilizer materials have proven satisfactory.

fertilizer when applied at the rate of 800 to 1,000 pounds per acre.

The 200 pounds of dolomitic limestone in the above mixture were shown to be very desirable for counteracting the acidity of the fertilizer and supplying some magnesium which is needed for many of the soils of the state on which the crop is grown. Heavy applications of limestone which would aid the scurf disease were discouraged.

Sweet potato growers were advised that in applying this fertilizer in the amounts suggested per acre, considerable injury to the stand would result during dry weather unless the fertilizer was applied deeply and well in advance of transplanting and was thoroughly mixed with the soil before the ridges or beds were thrown up. A safe procedure was to apply about one-half the fertilizer before planting, thoroughly mixing with the soil, and use the remainder as a side application very soon after transplanting. In making the side application the rows were barred off to get the fertilizer fairly deep into the soil on both sides of the row. After the fertilizer was applied, it was covered by throwing two furrows of soil over it.

With experiments in Virginia on placement of fertilizer, it has been shown that wide bands of it on each side of the row, after the plants were set, is a superior method in obtaining good stands and satisfactory yields. Research work in North Carolina and Virginia has shown that fertilization in the row at the time of planting or even shortly before planting may be injurious if the roots come in contact with the fertilizer or if the fertilizer salts move upward to the root zone during drought before the plants are well established.

South Carolina growers are being advised to give special care to attaining and improving the quality of seed stock. The fields in which seed stock is produced should be free of sweet potato diseases, some of which live in the soil for 3, 4, or 5 years. Therefore, special precautions are being

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View of a typical "mother patch" showing excellent vine growth.

Rhododendron and azaleas used as a shrub border to a lawn.

Good Shrubs Result From Good Treatment

By T. D. Gray

Landscape Architect, Agricultural Extension Service, Morgantown, West Virginia

MY EVERGREENS turn brown during hot weather, my goldenbell fails to bloom, my weigela kills to the ground each winter, are the wails which come from home owners far and wide. These favorites that seem to do so well elsewhere, that give some houses such a trim effect, are unsuccessful with those who write.

No panacea may be offered for all, however, if a careful check is made one will doubtless find lack of plant hardiness, bud hardiness, improper soil conditions, lack of water, fertilization, insects, or disease at the base of a vast majority of the trouble.

Naturally the question arises, what would you plant? In selecting material for plantings, it is necessary to consider first, hardiness of material. The best guide is the plants which grow naturally in the vicinity. If rhododendron, mountain laurel, azalea, andromeda, dogwood, redbud, spicewood, haw, or viburnum, snowberry, and coralberry grow wild, here is a nucleus to select from and add to. Secondly, comes the preference of individual owners. Some may prefer evergreens and some deciduous material. The pocketbook is a vital factor, for many cannot afford expensive materials, such as the evergreens and rarer types of materials. The effect which is wanted and the need for which the shrub is planted determine largely the selection. Freedom from disease and insect pests and adaptability to soil conditions will be the final factors.

One feels that those are a lot of hurdles to jump. This may be true; however, one vigorous, healthy shrub is much to be preferred to a dozen sickly, drooping ones. Go to the nearest reliable nursery and see what shrubs are doing well. Study them, and question the nurseryman about his practices in handling them. More will be learned here in a day than elsewhere in a month.

It is not so much a question of what shrubs are used in planting as it is the way in which they are used. The entire effect may be obtained through the use of a few evergreens, the tall chamaecyparis and arbor vitae for accent at corners and on either side of the entrance, supplemented with Pfitzer's junipers. A different effect may be obtained, but just as satisfactory, by using black-haw and mock-orange (*Philadelphus virginalis*) in place of the tall evergreens and supplementing with flame azaleas. Some would much prefer the latter.

There is too general a tendency to smother the foundations of buildings with excessive plantings. Like a wreath they drape the building. This may have been excused when high foundations of cement block and tile prevailed. Today, architects bring the house material to the soil line, making the house more attractive, and there is little excuse for blotting it out with shrubs.

Wood hardiness is true of many shrubs which are not bud hardy. This is particularly true in many instances with early flowering shrubs, such as spirea Thunbergi, spirea Vanhouttei, forsythias, flowering quince (*Cydonia japonica*), weigela, and magnolia. Warm days in January or February will start their buds swelling, and a succeeding cold snap often kills the entire crop. It has been found at Morgantown, W. Va., that we may expect good bloom from the above shrubs about once in four years. The same shrubs at Amherst, Mass., where the buds remain dormant throughout the winter, make a gorgeous spring display. Buddleia, abelia grandiflora, and some of the weigelas are not wood hardy and kill to the ground or may be entirely killed during the winter months. Why worry with those plants which are not hardy? Scratch them off the list and add those which are.

A Good Start

More failures can be traced to lack of good soil preparation than any other one cause. When cellars are dug, the soil is often used to fill in around the foundation. It's an easy place for the contractor to dispose of broken brick, cement block, and other waste material in construction. This is not good material in which to plant, and the filled soil should be removed to a depth of 18 inches and good garden soil added. Use plenty of well-rotted manure. If this cannot be obtained, use sheep manure, which may be bought commercially from any dealer in farm

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Wild crabapple, fragrant, flesh pink, is found throughout West Virginia.

Successful Strawberry Practices in the South

By L. A. Niven
Memphis, Tennessee

THE five-year average acreage in the United States devoted to the commercial production of strawberries is 180,360. Of this acreage 96,470 or 53.5 per cent is located in the 13 Southern states, thus showing that the South is the most important section of the United States as far as the commercial production of strawberries is concerned.

While the yield in the South, as elsewhere, varies from year to year, the average is right around 1,500 quarts per acre, or approximately 145,000,000 quarts—more than a quart for each man, woman, and child in the United States. If we assume the price average to be 10 cents per quart, which isn't far out of line over a period of time, we see this crop represents $14,500,000 annually to Southern growers. This certainly puts it in the "important" class as a Southern money crop.

The fact that it goes to market quite early in the spring, a time when the main Southern money crops have mostly been sold, makes it all the more important as a source of cash income at this time of year.

While this crop is grown over a rather wide range of territory, the heaviest producing sections are found in Florida, Louisiana, Alabama, Arkansas, Tennessee, North Carolina, Kentucky, and Virginia. Beginning in mid-winter in Florida, the season gradually pushes North, the shipping being largely completed in the upper South during May.

Select markets require careful grading before shipment.

When it's strawberry picking time down South.

The strawberry may be set any month during the year, but the best time is in fall, winter, or early spring. In the middle and upper South most of them are usually set between October and early April. Fall setting enables the plants to become established, for the root system to start growth, thus putting the plants in a more vigorous condition when the real growing season is at hand. Then too, when set in fall they will bear a small crop the following spring, whereas those set in late winter or early spring will not bear until a year after being set.

Soil Preparation

The strawberry will grow well on almost any type of soil, provided it is well drained and fertile. However, it is highly desirable that they follow a cleanly cultivated crop, such as cotton, corn, tobacco, soybeans, etc. In preparation for setting the plants the ground should be broken deep and thoroughly pulverized by harrowing. When the ground is thoroughly prepared, lay off the rows three and a half to four feet wide with a rather deep furrow or trench. Put in the bottom of this furrow a good commercial fertilizer, such as a 6-8-6 or 6-8-8, at the rate of 500 to 1,000 pounds per acre, or two to four pounds for each 100 feet of row space. Then throw the dirt back on it with two furrows so as to form a slight bed, and the plants are ready to be set. Be sure to get the fertilizer deep enough in the ground so that when the strawberry plants are set the roots will be at least an inch or two above the fertilizer, because allowing the roots to come in contact with the fertilizer will result in injury to the plants. At least 6 per cent of potash is needed in any strawberry fertilizer used, in order to produce properly colored and firm berries.

The plants should be set from 24 to 30 inches apart in the row. In the home garden set 18 to 24 inches apart. Plants set during late winter or early spring will, if allowed to do so, produce a few berries that season, but in order to get the best and most vigorous plants for producing a heavy crop the following season, it is advisable to pinch off the few blooms that appear the first season. If allowed to produce berries the first season these late set plants are weakened somewhat and are not in a position to produce a maximum crop the following year.

Cultivate often enough throughout spring, summer, and into the fall to keep them free of all weeds and grass. Do not disturb the runners as they develop. Allow them to run over the

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California Prunes Respond to Potash

By B. E. Maynard
San Jose, California

IN CALIFORNIA where dry summers prevail, the question sometimes arises, Is it possible to obtain results from the use of fertilizers in unirrigated orchards? In fact, many fruit growers in unirrigated districts have refrained from the use of fertilizers, due to the belief that it is useless to apply them where winter rainfall alone had to be depended upon. That such reasoning is without any foundation in actual practice has been definitely proved in a number of instances in the past.

Weathered Hot Spells

Two illustrations given herewith, taken from results recently obtained in tests carried out by individual growers under unirrigated conditions, conclusively indicate that fertilizers can be profitably used where moderate winter rainfall is the only source of water obtainable. These two tests, as well as others that are made, further indicate that potash, when abundantly provided, is a very important factor in enabling the trees to resist drought and withstand injury from excessive heat. During a hot spell that occurred, just before the prune crop began to ripen, the trees and fruit in plots where potash had been used showed but little injury, whereas trees and fruit in adjoining plots where no potash had been applied suffered greatly.

To determine the effect of nitrogen and potash on his unirrigated prune orchard near Morgan Hill, California, Carl Schrader for the past 3 years has had a series of plots. One plot received nitrogen and potash, a second plot was given nitrogen only, while a third plot, of an equal number of trees, received no fertilizer and was used as a check. The trees selected for this demonstration were of the same age and were very uniform in general condition and size. However, all of the trees when this demonstration was inaugurated showed marked evidence of potash hunger, as is the case in other orchards in this vicinity, even where irrigation is practiced. Soil tests also show that these soils are very low in available potash, there being a strong correlation between these soil tests and the condition of the trees.

Improved Production

In the tests carried out by Mr. Schrader there has been a steady and marked improvement in the condition and productivity of the trees where potash has been applied, as compared with those in adjoining plots where it was omitted. Although nitrogen undoubtedly is needed on this place, where it was used alone the trees showed little benefit, due to lack of potash. In fact, evidences of potash hunger were more marked in trees receiving nitrogen only than in the rest of the orchard where no fertilizer had been applied. In the plot where potash was applied, the trees have improved greatly, and indications of

potash hunger have practically disappeared. These trees also came through an exceptionally hot spell shortly before harvesting time in 1935 with minimum injury to either leaves or fruit, whereas the trees in plots and the rest of the orchard receiving no potash suffered greatly from twig dieback and leaf scorch. Injury to fruit also caused a serious loss of crop.

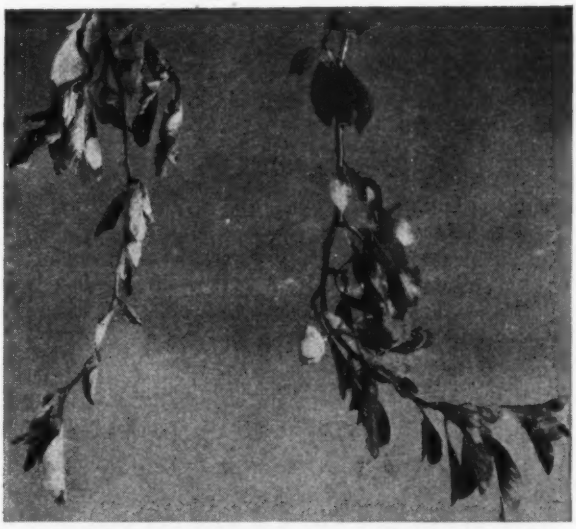
Mr. Schrader's figures giving the 1934-1935 returns from this test are as follows:

In Plot 1 (NK) each tree for the past 3 years has received annually 2½ pounds of sulphate of ammonia and 1½ pounds of actual potash (K_2O).

In Plot 2 (N) each tree has received annually 2½ pounds of sulphate of ammonia but with the potash omitted.

In Plot 3 (Check) no fertilizer was applied.

In the above only the second and third pickings are taken into consideration, as no record was kept of the first and fourth.



Potash deficiency symptoms showing on the Schrader prune trees.

In comparing the returns from Plot 1 with Plot 2 it will be seen that the value of the crop was reduced $77.33 per acre in 1935 and $43.34 in 1934 by omitting potash in Plot 2.

Plot No.	1934 Yields and Values per Acre (base price 4c per lb.)		1935 Yields and Values per Acre (base price 2¼c per lb.)	
1 (NK)	2,030 (pounds dry)	$95.43	3,564 (pounds dry)	$122.96
2 (N)	1,144 " "	$52.09	1,440 " "	$ 45.63
3 (Check)	1,220 " "	$53.70	1,026 " "	$ 33.34

By omitting both nitrogen and potash, as shown by the return from the check plot compared with Plot 1, the value of the crop was reduced $89.62 per acre in 1935 and $41.73 in 1934.

A demonstration similar to the one carried out by Mr. Schrader is being conducted by F. F. McQuilkin of Gilroy, California. In this case the soil is a deep adobe which readily slacks on exposure to the air, forming a desirable summer mulch. This orchard also is unirrigated. The condition of the trees on this place indicates a serious potash deficiency, and the soil tests bear this out.

The prune crop for 1935 in this orchard was light, but the effect of potash was very marked in the improved condition of the trees, as well as in increased production and sizes of the fruit. Mr. McQuilkin's report on the 1935 and 1936 returns is based on 75 trees per acre and values in accordance with sizes at a market basis price of 2¼c per pound in 1935 and 3½c in 1936.

In Plot 1 (N) each tree received

2½ pounds of sulphate of ammonia but no potash.

In Plot 2 (NK) each tree received 2½ pounds of sulphate of ammonia and 1½ pounds of actual potash (K_2O).

In Plot 3 (Check) the trees received no fertilizer.

Plot No.	1935 Yields and Values per Acre (base price 2¼c per lb.)		1936 Yields and Values per Acre (base price 3½c per lb.)	
1 (N)	720 (pounds dry)	$25.20	3,232 (pounds dry)	$144.16
2 (NK)	1,837 " "	$68.91	3,967 " "	$188.85
3 (Check)	420 " "	$14.70	1,342 " "	$ 53.70

By comparing the returns from Plot 1 in Mr. McQuilkin's orchard with Plot 2, it will be noted that omitting the potash in Plot 1 resulted in a loss of $43.71 per acre in 1935 and $44.69 in 1936. In comparing Plot 2 with Plot 3, the check plot, we find that omitting both nitrogen and potash in the check plot resulted in a loss of $54.21 per acre in 1935 and $135.15 in 1936.

The trees in Plot 2 (NK), the only ones that received potash, withstood drought and an excessively hot spell preceding harvesting far better than any of the others. The foliage throughout the season maintained a rich, healthy, green color, and evidences of potash hunger have practically disappeared from this plot.

In Plot 1 the trees receiving nitrogen only showed considerable response, indicating the need of nitrogen in this orchard too, but indications of a potash deficiency are still very evident. On the check plot where no nitrogen or potash was applied, the crop was practically a failure, and the trees suffered greatly during the hot spell, showing much leaf scorch, mottling of the foliage, and twig dieback. Several of the trees looked as if they were about ready to die.

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Typical twigs from test plots on the McQuilkin orchard, Gilroy, California. Left—nitrogen treatment, center—nitrogen-potash treatment, right—check plot (untreated).

Good Reasons For
Fertilizing Corn

By Arthur O. Braeger
Wisconsin College of Agriculture, Madison, Wisconsin

WHILE growing corn with fertilizers is not an entirely new style in farming, it continues to be a profitable investment. Since the time when the American Indian first began this program by placing a fish in the corn hill, to present day practices of fertilizing, the returns in corn production have increased with the betterment of fertilizing practices.

Farmers state that maturity has been advanced from a week to 10 days; yields have increased from 5 to 15 bushels per acre. Fertilizers get the crop ahead of the weeds, so that the corn can be cultivated earlier and more effectively, and it has been found that they improve the quality and increase the feeding value of the corn crops, according to C. J. Chapman, of the soils department, University of Wisconsin.

Chapman gives five reasons for fertilizing the corn crop: (1) To start the crop off quickly; (2) to get it ahead of the weeds; (3) to advance maturity; (4) to improve feeding quality and feeding values; (5) to increase yields. For these reasons, Wisconsin farmers have found commercial fertilizers to be a valuable supplement to stable manure.

In order to get a clear picture of corn fertilization, the plant-food needs of the plant must be considered. A 75-bushel crop of corn plus fodder requires about 125 pounds of nitrogen. Corn is a rather heavy feeder on potash, a 75-bushel crop requiring about 93 pounds. The phosphorus requirement of a 75-bushel crop of corn including fodder amounts to about 56 pounds of phosphoric acid per acre.

Ten tons of manure contain about 100 pounds of nitrogen, but only a part of this 100 pounds contained in the manure is available, Chapman points out. Clover sod furnishes some nitrogen, and furthermore, sod land usually works up loose and friable. It is filled with decaying roots, and not only does this organic matter or humus act as a sponge to conserve moisture, but it is valuable from the standpoint of preventing erosion.

Heavy Potash Feeder

As has been stated before, corn is a rather heavy feeder on potash. Chapman says that while 10 tons of manure does supply about 100 pounds of potash, only a portion is available, and it is found that during the early stages of growth a small amount of potash contained in a commercial fertilizer applied near the hill is helpful. Of course, the need for potash in a fertilizer for corn is greater where no manure is applied. But under any conditions, it is possible to supply only a small fraction of the total potash requirement of the corn crop by the hill-drop method.

A lack of phosphorus results in soft, immature corn. It is known that manure can supply but very little phosphorus, and for that reason many of our soils are lacking in this element, due to continuous cropping of land

and the loss of phosphorus through the sale of farm products. This is the reason why commercial fertilizers for corn are high in this plant food.

Hill Fertilization

In Wisconsin the practice of hill dropping a small shot of fertilizer with an attachment on the corn planter has done much to improve the quality, increase the yield, and advance the maturity of our corn crop. In regard to broadcast applications, Chapman believes that there may be some instances where this is advisable, but in general he recommends that the broadcast treatment be made to the grain and hay crops. The fertilizer should be applied at the time of seeding and worked into the soil. There is always some residual benefit from phosphate applied at the time of seeding, which is available to the corn crop 2 years later, but even here the use of a small application of fertilizer in the hill of corn is advisable.

The side-dressing attachment for the sulky cultivator is not advisable for the application of fertilizers to corn unless the fertilizer is applied within a few days after planting. If farmers wait until the corn is large enough to cultivate the first time, they will have passed up their greatest opportunity for helping this crop in the early stages. Where farmers blind cultivate their corn immediately following planting, the use of the attachment on the sulky cultivator may be an effective way of applying fertilizer.

Chapman gives the following recommendations for the fertilization of corn:

"On the loose, friable, prairie soils as a supplement to stable manure, we usually recommend the straight 20 per cent or 40 per cent superphosphates—from 90 to 100 pounds per acre where drilled. When the more concentrated 45 per cent is used, it should be applied at rates of from 75 to 125 pounds to the acre and all drilled.

"On the heavier soils, silt loams, clays, particularly the lighter colored silt and clays where the corn usually starts rather slow, I would advise the use of a fertilizer carrying some nitrogen and potash as well as phosphoric acid. Such mixtures as the 3-16-4, 2-12-6, 4-24-12, or a 4-16-4 are being used with excellent results. I should prefer the 3-18-9 or 4-24-12. These fertilizers should be applied in amounts from 60 to 100 pounds per acre where checked or from 100 to 175 pounds per acre where drilled, depending on the concentration of mixture used."

Broadcast Method

On sandy soils, Chapman is not so enthusiastic over hill fertilization of corn. On such soils, he advises that most of the fertilizer be applied broadcast for grain at the time of seeding to clover or alfalfa. He has observed, however, good results on such soils from fertilizers applied with an attachment on the corn planter. He feels that it is usually advisable to drill the fertilizer rather than check it by reason of the danger of injury to germination on these lighter soils. Such mixtures as the 3-12-12, 0-14-14, or 0-20-20 have been used with excellent results on the lighter soils.

For peat or muck soils, Chapman advises that such mixtures as the 0-8-24, 0-9-27, 3-9-18, or 2-8-16 mixtures are being used with excellent results. Up to 300 pounds per acre can be applied with an attachment on the corn planter. On the mucks or peats, the fertilizers should be drilled continuously rather than checked. Cross cultivation, of course, will result in some distribution of the fertilizer.

Some farmers have reported to Chapman that they have experienced disastrous results where fertilizers have been applied improperly. "For better results," Chapman says, "the fertilizer where applied with an attachment should be delivered in a band about

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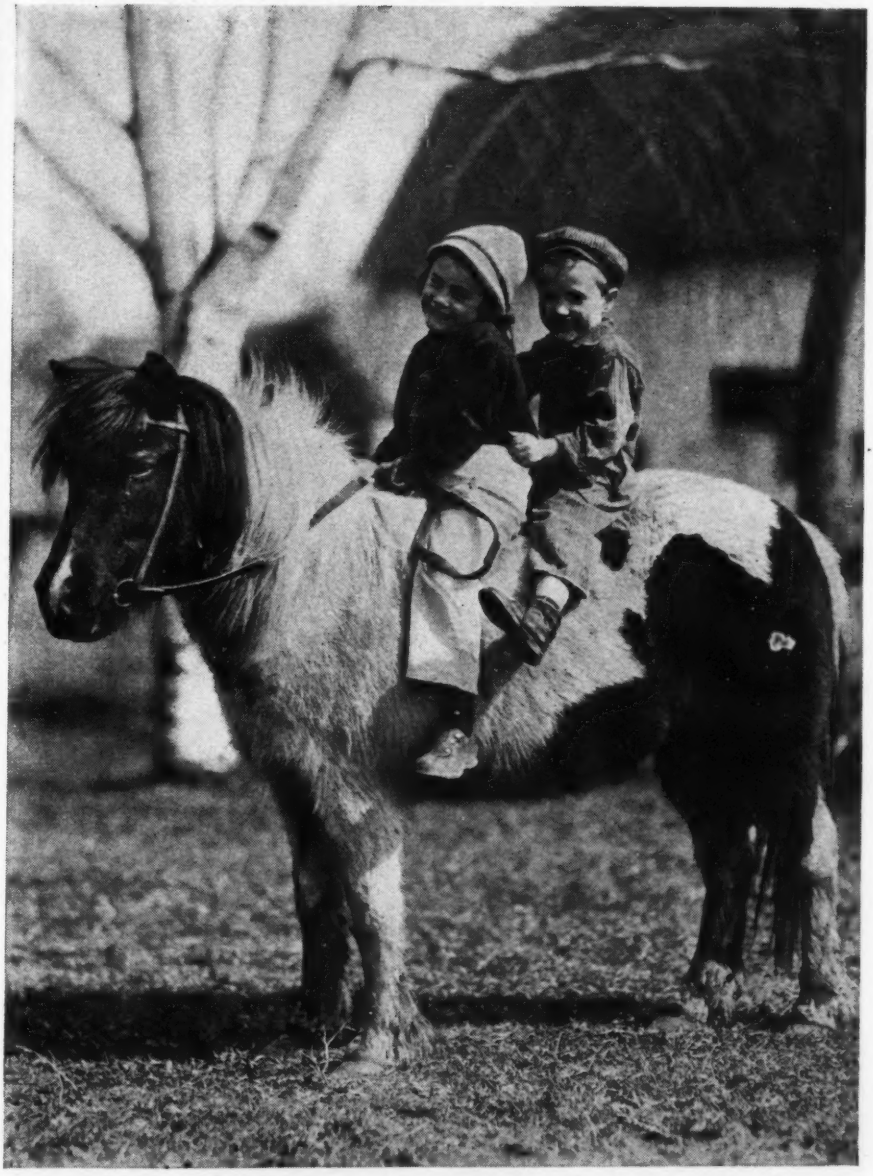
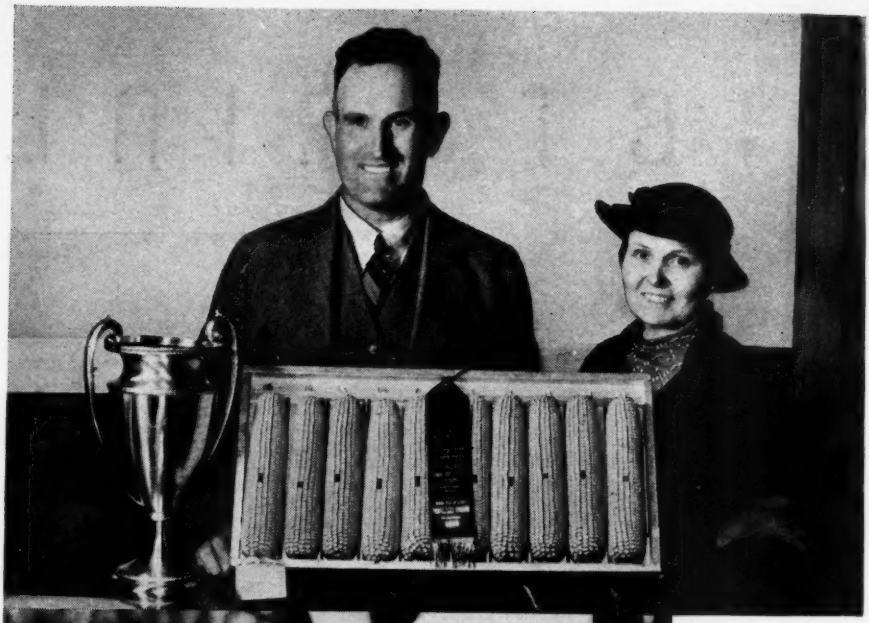
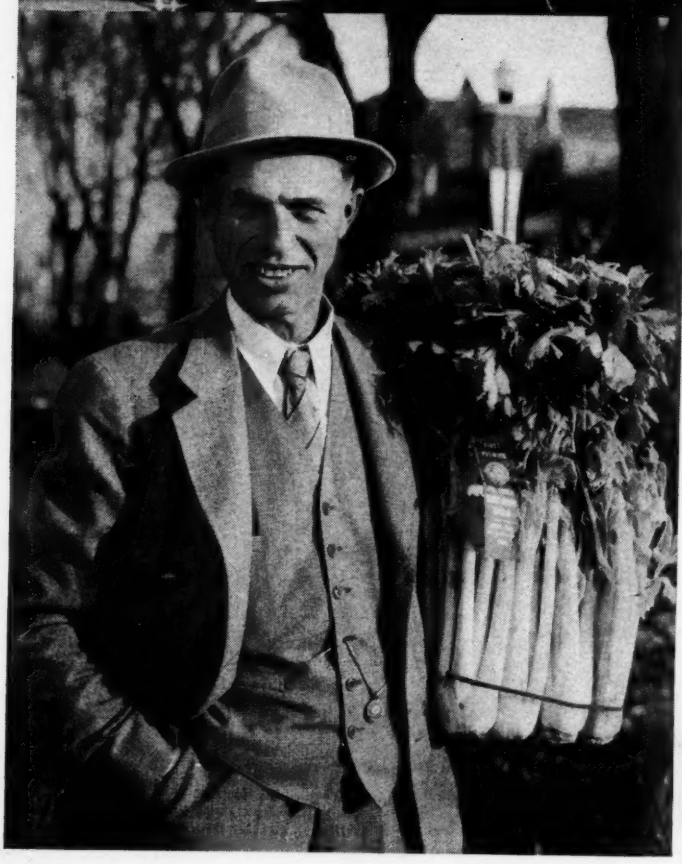
PICTORIAL



All's well while posing for the camera, but wait till the trotting begins!



The smile of a winner — William Curry, new World's Corn King, and his Queen, Mrs. Curry, who won the grand Sweepstakes award at the International Hay and Grain Show, Chicago, with his entry of Curry's Yellow Dent corn. He used an 0-14-6 fertilizer.



"Most Distinguished Muck Crops Farmer in Indiana for 1936," is the title awarded John Kiesling of Logansport. Mr. Kiesling farms in Fulton County, and his entries at the State Muck Crops Show, Akron, Indiana, won many first prizes.

Indiana's Queens of the Muck Crops, Miss Evelyn Edwards (left), of Knox and Miss Marcille Fleck (right) of Disko, who were chosen the most beautiful girls at the State Muck Crops Show held at Akron.

E. R. Troyer of LaOtto, the 400-bushel Potato Club Champion shown with Roscoe Fraser (right) of the Purdue Extension Department. Mr. Troyer produced 493 bushels of U. S. No. 1 potatoes per acre in his field of 13 acres. He fertilized the potatoes with 500 pounds of 0-8-24 per acre.

Sand drifts—snow drifts. Nature's restless mood described in new contours.

The Editors Talk

More Money For Research

The launching of the first million-dollar block of what is to develop as a five-million-a-year research program under the Bankhead-Jones Act was the principal new development in the work of the Office of Experiment Stations, U. S. Department of Agriculture, James T. Jardine said in his annual report made public recently. The Bankhead-Jones Act was approved June 29, 1935. It appropriated $1,000,000 for research in the fiscal year ending June 30, 1936, and provides for an annual increase of $1,000,000 each year until the annual appropriation is $5,000,000. The act permits the expansion of agricultural research, both state and federal. The intent of the act is also to favor even closer coordination of research between states and between states and federal agencies.

Three regional research laboratories are already under way. One of these is the laboratory for research in vegetable breeding near Charleston, S. C.; a second is the soybean research laboratory at the University of Illinois; the third is the joint study of grass breeding and pasture improvement for the Northeast at Pennsylvania State College. In addition, 32 other special research projects deal with fundamental problems of agriculture in its broadest aspects.

These additional funds will make available opportunities for research which is essential as a foundation to an efficient agriculture.

Well-Balanced Fertilizers

For a fertilizer to be well-balanced, it must contain the right amounts of the plant foods needed to supplement the available nutrients in the soil in order to fully meet the requirements of the crop. A complete fertilizer containing nitrogen, phosphate, and potash is not necessarily always a well-balanced fertilizer. It may contain too little or too much of any one of these elements. Different crops use more of one plant food than others, and soils vary greatly in their ability to supply this plant food. Only a knowledge of the available plant-food nutrients of particular soils and of the requirements of the crop permits the grower to properly balance his fertilizer.

In recent years rapid chemical and biological methods of testing soils for available plant foods have been developed. Associated with the use of rapid methods is the better knowledge of what crops remove from soils and symptoms of specific plant-food deficiencies. Growers should not think of fertilizers in terms of the analysis alone, but also in terms of the number of actual pounds

of each nutrient a certain analysis will supply per acre in the amounts of the fertilizer they are using, and to think of this number of pounds in relation to the requirements of their crops and soil supply.

The use of fertilizers in terms of so many pounds of each nutrient per acre is growing. Many farmers are already doing this. However, when a grower realizes he needs more of any certain element, the question arises: Should he continue using an increased number of pounds of the same analysis? It may be that he is then applying more of one plant food in the analysis than is required. It is often better to change the analysis to a different ratio. Such a practice is more economical and results in a much better nutritional balance, higher yields, and better crop quality.

The range of fertilizer analyses now on the market makes it possible for growers to obtain suitable combinations of the essential plant nutrients for the majority of soil and crop needs. The urgent need is to impress upon farmers the importance of using their fertilizers in terms of pounds of each of the essential plant foods in accordance with their soil and crop needs. Then is the fertilizer well-balanced.

Reclaiming the Zuider Zee

Information on recent progress in reclaiming the Zuider Zee for agricultural purposes has just been published by N. V. Handelsdrukkerij Holdert & Company, Amsterdam, Holland. The report is divided into two chief sections. The first, of a more technical character, reports work on the enclosing dam, the maintenance of weirs and locks, and the continuation of reclamation operations. The second section, of more interest to agriculturists, discusses the cultivation of the Wieringermeer.

As in all projects involving methods of freeing the soil from salt, progress in this phase of the work is of primary importance in replying to the question of whether or not the soil is suitable for cultivation. These methods are referred to as "freshening" the soil and require continual care. In the larger part of the reclaimed area the presence of salt does not now injure the development of crops, although salt concentrations are still found. The movement of salt in these areas occasionally presents an uncertain factor, especially in dry periods.

Experience gained from experimental plots in maintaining soil tilth and fertility has saved much disappointment. Phosphoric acid was found to be necessary on the lighter soils. On sand-grassland a need for potash shortly after cultivation was started was found to be necessary. Several questions in relation to the efficient use of fertilizers still have to be worked out.

The report also contains vital data on population and the general management of the new polders. The people of the Netherlands are to be congratulated on the excellent progress that is being made in reclaiming land from the Zuider Zee, not only for agriculture, but for placing and developing in social security and happiness, whole new populations.

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Fertilizers, Soils, Crops, and Economics. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

Many important suggestions regarding the fertilizers suitable for field crops in Louisiana are contained in Ext. Cir. 167 of the Louisiana Agricultural Extension Service entitled, "Fertilizers for Field Crops in Louisiana," by W. G. Taggart, M. B. Sturgis, H. C. Lovett, and R. A. Wasson. The authors point out that a large number of planters have become more accustomed to consider the application of fertilizer in terms of pounds of plant food per acre rather than so many pounds of a certain fertilizer analysis. This highly commendable practice is more likely to result in adequate and efficient fertilization than applying simply so many pounds of an analysis per acre, frequently without very much attention to the needs of the soil or crop.

Fertilizers for cotton on Coastal Plain soils having permeable, well-drained sub-soil would be expected to give satisfactory results from applications of 400 to 600 pounds of 6-8-4 or 4-8-4 per acre. The 4-8-6 or 6-10-7 analyses would be better adapted on the more sandy type and on soils where cotton is known to be susceptible to rust. Analyses such as 4-12-4, 4-8-4, and 6-10-7 are most applicable for Coastal Plain soils which have plastic, or poorly permeable subsoils.

An application of from 400 to 600 pounds of 6-8-4, 4-8-4, and 4-12-4 should prove satisfactory for cotton on the flatwoods and Coastal Prairie soils. The Mississippi Bluff and Prairie Soils are very responsive to fertilization. Recommendations for these soils include 6-8-4, 4-8-6, and 6-10-7 ratios at the rate of 600 pounds per acre. The fertile first bottom soils of the Red and Mississippi Rivers where good farming practices have been followed give favorable responses to nitrogen fertilizers. Under many conditions the use of 300 pounds of a 12-8-0 per acre should prove profitable on the more sandy series.

An application of 200 pounds of 4-8-4 per acre for corn is advised when the soil is low in phosphorus and potassium. Side-dressing with 100 pounds of a quick-soluble nitrogen fertilizer applied when the corn is knee high is also recommended by the authors. On more fertile soils nitrogen alone is recommended. Stubble cane is commonly fertilized with about 200 pounds of 15 to 20 per cent nitrogen fertilizer, or 300 pounds of 12-8-0. Applications of 300 pounds of 8-8-4 or 8-8-8 per acre to rice at planting time could be expected to give significant increases in yield.

The circular states that very good results have been obtained from the use of 200-300 pounds per acre of 3-12-6 on mixed pasture. In addition, 0-15-6 and 4-10-7 are recommended on Coastal Plain soils. On green pastures, 4-10-7 is considered a well adapted analysis.

Included in this interesting publication is a map which gives the locations of the various important soil groups in Louisiana. This permits a more

accurate estimation of the fertilizer needs of an area or location.

"The Value of Lime in a Two-year Rotation on Sand Mountain," Agr. Exp. Sta., Auburn, Ala., Cir. 75, Oct. 1936, M. J. Funchess.

"Fertilizer Recommendations for Field Crops," Agr. Ext. Serv., Little Rock, Ark., Cir. 214, Rev. June 1936, Martin Nelson and D. J. Burleson.

"Fertilizers for Irish Potatoes, Sweet Potatoes, Tomatoes, Muskmelons, and Watermelons," Agr. Exp. Sta., Fayetteville, Ark., Bul. 333, June 1936, J. R. Cooper and V. M. Watts.

"A Study in Soil Nitrogen," Agr. Exp. Sta., Amherst, Mass., Bul. 333, July 1936, F. W. Morse.

Soils

According to H. H. Bennett, in Miscellaneous Publication No. 253, U. S. D. A. entitled, "Conservation Farming practices and Flood Control," the role of farmers in the prevention and control of flood waters cannot be minimized. By slowing down the run-off of rain water in order to curb erosion, the farmer simultaneously reduces the volume and velocity of water which might otherwise contribute to floods. At the same time, the soil which is held on the land by erosion control methods is kept out of the streams where it would reduce the water-carrying capacity of the channels and fill up costly reservoirs. "Floods are simply raindrops infinitely multiplied and concentrated quickly in a single channel."

The publication outlines some of the most effective methods of decreasing run-off and erosion by means of vegetation and mechanical control. Definite progress in the prevention and control of floods can be expected if farmers will adopt contour stripcropping, terracing, crop rotations, contour tillage, check dams and grassed waterways, and other inexpensive soil and water conservation practices, the author declares. The majority of farmers have viewed the whole difficult problem of flood control as strictly an engineering problem involving the construction of downstream levees, dams, revetments, and spillways. Enormous quantities of rain water that should have been stored in soils for crop use during dry seasons have flowed away as so much waste. By proper use of his land the farmer contributes substantially to the desired end of not only conserving soil water but controlling run-off and the surge of flood waters as well. This fact is substantiated by data obtained from the erosion experiment stations of the Soil Conservation Service throughout the country.

The author emphasizes that, "Except the oceans there is no reservoir for water so vast and effective as the soil. It is this great reservoir that the farmer can utilize in his contribution to flood control."

"Use of Water by Washington Navel Oranges and Marsh Grapefruit Trees in Salt River Valley, Arizona," Agr. Exp. Sta., Tucson, Ariz., Bul. 153, Aug. 15, 1936, Karl Harris, A. F. Kinnison, and D. W. Albert.

"Field Characteristics and Partial Chemical Analyses of the Humus Layer of Longleaf Pine Forest Soils," Agr. Exp. Sta., Gainesville, Fla., Bul. 302, Sept., 1936, Frank Heyward and R. M. Barnette.

"If Your Land is Acid," Circular, Agr. Ext. Serv., Urbana, Ill., H. M. Mumford, Director.

"Soil Survey of Iowa, Monroe County," Agr. Exp. Sta., Ames, Iowa, Soil Survey Report 76, Sept. 1936, P. E. Orrben, H. R. Meldrum, and A. J. Engleborn.

"A Land Use and Soil Management Program for Tennessee," Agr. Ext. Serv., Knoxville, Tenn., Pub. 197, Nov. 1936, H. E. Hendricks.

"Soil Survey of Randolph County, West Virginia," U. S. D. A., Washington, D. C., Series 1931, B. H. Williams and H. M. Fridley.

Crops

A recent publication of particular value to farmers, county agents, and other groups interested in agricultural advancement is Arkansas Extension Circular No. 380 entitled, "4-H Club Manual in Growing Early Irish Pota-

toes," by Claude Woolsey. An important consideration for the profitable production of high acre yields of good quality potatoes is the selection of suitable soils, preferably gravelly or sandy loam types that are well drained and provided with an ample supply of plant food. It is suggested that stiff clay soils and sandy soils be avoided. The use of cover crops to supply humus and organic matter is stressed. A good practice is to plow under a crop of soybeans, vetch, or cowpeas previous to planting. The land should be well prepared and worked down to a fine crumbled condition.

The publication details good practices more in line with conditions to be found in this state. However, it emphasizes fundamental points, including the use of proper fertilizers, selection of varieties, seed stock, amount and size of seed, cultivation, diseases and insects, sprays, and selecting and exhibiting potatoes. Such manuals for 4-H Club use should aid greatly in furthering the efficiency of this great agricultural youth movement which has become such an important part of our agricultural industry.

"4-H Club Manual in Cotton Production," Agr. Ext. Serv., Little Rock, Ark., Cir. 160, *Rev. June* 1936, *D. J. Burleson.*

"Lespedeza," Agr. Ext. Serv., Little Rock, Ark., Cir. 185, *Rev. June* 1936, *Martin Nelson.*

"Establishing the Peach Orchard," Agr. Ext. Serv., Little Rock, Ark., Cir. 191, *Rev. June* 1936, *Claude Woolsey.*

"Early Tomato Production in Arkansas," Agr. Ext. Serv., Little Rock, Ark., Cir. 223, *Rev. June* 1936, *Claude Woolsey.*

"Production and Harvesting of Watermelons in Arkansas," Agr. Ext. Serv., Little Rock, Ark., Cir. 225, *Rev. June* 1936, *Claude Woolsey.*

"Permanent Pastures," Agr. Ext. Serv., Little Rock, Ark., Cir. 334, *Rev. June* 1936, *Martin Nelson.*

"Shrubs, Their Propagation and Management," Agr. Ext. Serv., Little Rock, Ark., Cir. 345, *Rev. June* 1936, *Claude Woolsey.*

"4-H Club Manual in Sweet Potato Production, Handling, and Marketing," Agr. Ext. Serv., Little Rock, Ark., Cir. 381, *June* 1936, *Claude Woolsey and J. H. Heckman.*

"Soybean Varieties for Hay, Seed, and Oil Production," Agr. Exp. Sta., Fayetteville, Ark., Bul. 334, *June* 1936, *C. K. McClelland.*

"Study of Relation of Growth to Nutrition of the Rice Plant." Agr. Exp. Sta., Fayetteville, Ark., Bul. 335, *June* 1936, *L. C. Kapp.*

"Forty-ninth Annual Report of the Director of the Colorado Experiment Station," Colo. Exp. Sta., Fort Collins, Colo., E. P. Sandsten, Director.

"Barley Production in Colorado 1928-1935," *Colo. Exp. Sta., Fort Collins, Colo. Bul.* 431, *Aug.* 1936, *D. W. Robertson, Dwight Koonce, J. J. Curtis, and J. F. Brandon.*

"Further Studies on Vitamins in Alfalfa Hay," Colo. Exp. Sta., Fort Collins, Colo., Tech. Bul. 18, *Sept.* 1936, *C. E. Vail, J. W. Tobiska, and Earl Douglass.*

"Forty-eighth Annual Report, Georgia Experiment Station," Agr. Exp. Sta., Experiment, Ga., H. P. Stuckey, Director.

"Rates of Seeding Small Grains and Winter Legumes for Hay," Ga. Exp. Sta., Experiment, Ga., Bul. 194, *July* 1936, *R. P. Bledsoe and S. J. Hadden.*

"Commercial Mushroom Production," Agr. Exp. Sta., East Lansing, Mich., Cir. Bul. 158, *Nov.* 1936, *C. H. Mahoney, E. A. Bessey, and E. I. McDaniel.*

"The Value of Winter Green Manure Crops," Agr. Exp. Sta., New Brunswick, N. J., Bul. 609, *Sept.* 1936, *Howard B. Sprague.*

"The Bimonthly Bulletin," Agr. Exp. Sta., Wooster, Ohio, Vol. XXI, No. 183, *Nov.-Dec.* 1936.

"Corn Production," Agr. Ext. Serv., Clemson, S. C., Cir. 89, *Rev. June* 1936, *R. W. Hamilton and B. E. G. Pritchard*

"Extension Work in South Carolina 1935," *Agr. Ext. Serv., Clemson, S. C., D. W. Watkins, Director.*

"Farm Gardens," Agr. Ext. Serv., Knoxville, Tenn., Pub. 145, *Rev. Jan.* 1936, *W. C. Pelton.*

"Raspberries, Blackberries, Dewberries in the Farm Garden," Agr. Ext. Serv., Knoxville, Tenn., Pub. 191, *Jan.* 1936, *W. E. Pelton.*

"Planning and Care of the Farm Garden," Agr. Ext. Serv., Knoxville, Tenn., Pub. 192, *Apr.* 1936, *N. D. Peacock and A. B. Strand.*

"Better Home Grounds. Growing and Transplanting Trees and Shrubs," Agr. Ext. Serv., Knoxville, Tenn., Pub. 196, *Nov.* 1936, *W. C. Pelton.*

"Important Steps in Growing Sudan Grass," Agr. Ext. Serv., College Station, Texas, L-9, Jan. 1936, *E. A. Miller.*

"Important Steps in Growing Peanuts," Agr.

Ext. Serv., College Station, Texas, L-11, Jan. 1936, E. A. Miller.

"Important Steps in Growing Soy Beans," Agr. Ext. Serv., College Station, Texas, L-12, 1936, E. A. Miller.

"Important Steps in Growing Cowpeas," Agr. Ext. Serv., College Station, Texas, L-13, 1936, E. A. Miller.

"Forty-eighth Annual Report, 1935," Agr. Exp. Sta., College Station, Texas, A. B. Conner, Director.

"Publications with Author Index, Classified by Series from 1890 to June 30, 1936," Agr. Exp. Sta., Logan, Utah. Misc. Pub. 15, June 1936, Blanche C. Pittman.

"Agricultural Seed," Agr. Exp. Sta., Burlington, Vt., Bul. 410, Oct. 1936, Anna S. Lutman.

"Korean Lespedeza and Lespedeza Sericea Hays for Producing Milk," Agr. Exp. Sta., Blacksburg, Va., Bul. 305, Sept. 1936, C. W. Holdaway, W. B. Ellett, J. F. Eheart, and A. D. Pratt.

"Group Discussion and County Agricultural Program Planning," Agr. Ext. Serv., Blacksburg, Va., 1936, B. L. Hummel.

"Department of Agriculture-Immigration," Richmond, Va., Bul. 343, Nov. 1936, and Bul. 344, Dec. 1936.

"Succulent Feed Crops. Cost of Producing in Northern Wisconsin," Agr. Exp. Sta., Madison, Wis., Bul. 436, July 1936, E. J. Delwiche.

"What is Hybrid Corn?" Agr. Ext. Serv., Madison, Wis., Cir. 282, Sept. 1936, A. H. Wright, N. P. Neal, and E. J. Delwiche

"Index Bulletin H, Sept. 1936," Agr. Exp. Sta., Laramie, Wyo., Margaret Lamb.

"Report of the Secretary of Agriculture for 1936," U. S. D. A., Washington, D. C.

"Planning the 1937 Farm Program," U. S. D. A., Washington, D. C., G-60, Sept. 25, 1936.

"Blue Grama Grass for Erosion Control and Range Reseeding in the Great Plains and a Method of Obtaining Seed in Large Lots," U. S. D. A., Washington, D. C., Cir. 402, July 1936, Jess L. Fults.

"Identification, History, and Distribution of Common Sorghum Varieties," U. S. D. A., Washington, D. C. Tech. Bul. 506, July 1936, H. N. Vinall, J. C. Stephens, and J. H. Martin.

Economics

Much interesting information is presented in Extension Circular No. 351, "Types of Farming in Arkansas," which was prepared by the Research and Extension Staff of the College of Agriculture of the University of Arkansas.

Types of farming are defined according to the enterprise or combination of enterprises used on individual farms. Natural conditions and economic forces which cause different enterprises to be selected in different areas largely account for the types of farms. Where the natural and economic conditions are favorable, production costs are low, and vice versa. Thus, farming types are grouped according to what experience has taught farmers of a given locality to be the most advantageous combination of enterprises. For example, cotton farms are located in the lowlands and on the better uplands throughout the state, with the exception of the rougher land and the cooler altitudes. Rice farms are found in level areas having a particular type of soil and subsoil and available water for irrigation. Fruits or vegetables are grown in localities favorable to growth and market outlets. Livestock is raised on the rougher land type where pasture grasses thrive. Mixed farming is carried on where some of the conditions favor one enterprise and other conditions favor another enterprise.

The productivity of soil in Arkansas varies widely from one area to another. A suggested classification on the basis of average yield is as follows: Non-agricultural, unproductive, low, moderate, good, high, very high, and exceptionally high productivity. The first two groups should not be devoted to agriculture or cultivated crops. In some instances, hay or other low-cost crops might be grown to an advantage. The other groups differ only in the degree of yield. However, the soils of moderate and good productivity must be managed better if present yields are to be maintained. It is possible that farmers can secure yields above the average for the soil type on which they are located, provided good management practices are followed,

such as the use of crop-rotation, legumes, and cover crops. It is also possible to increase the yield by the proper use of fertilizer. However, due to the great variation of the natural productivity of Arkansas soils no set formula or rate of application can be given for general use.

"Fertilizer and Fertilizer Material," Dept. of Agr. and Ind., Montgomery, Ala., Dept. Bul. 32, Fiscal Yr. 1935-36, R. J. Goode, Commissioner.

"Illinois Farm Economics," Agr. Ext. Serv., Urbana, Ill., No. 18, Nov. 1936.

"Commercial Fertilizers," Agr. Exp. Sta., Lafayette, Ind., Cir. 222, June 1936, H. R. Kraybill, O. W. Ford, O. S. Roberts, L. E. Horat, M. H. Thornton, S. M. Cohee, and J. W. Jackman.

"The Kansas Agricultural Outlook for 1936-37," Agr. Ext. Serv., Manhattan, Kans., Cir. 126, Aug. 1936, H. Umberger, Director.

"Inspection of Commercial Fertilizers," Agr. Exp. Sta., Amherst, Mass., Control Series, Bul. 84, Oct. 1936, H. D. Haskins.

"The Cranberry Industry in Massachusetts," Agr. Exp. Sta., Amherst, Mass., Bul. 332, June 1936, C. D. Stevens, H. J. Franklin, C. I. Gunness, and V. C. Peterson.

"Farm Economics," Cornell Univ., Col. of Agr., Ithaca, N. Y., No. 97, Nov. 1936.

"Analyses of Commercial Fertilizers for Fall Season 1935. I. Mixed Fertilizers. II. Fertilizer Materials," State Dept. of Agr., Raleigh, N. C., Mar. 1936, Wm. A. Graham, Commissioner.

"Inventory of Land Use in Tennessee," Agr. Exp. Sta., Knoxville, Tenn., Report No. 5, Feb. 1936, Charles E. Allred, Samuel W. Atkins, Walter P. Cotton, and John E. Mason.

"Regional Grouping of Crop Production in Tennessee," Agr. Exp. Sta., Knoxville, Tenn., Report No. 12, May 1, 1936, Charles E. Allred, William E. Hendrix, and Benj. H. Luebke.

"Commercial Fertilizers in 1935-36," Agr. Exp. Sta., College Station, Texas, Bul. 529, Sept. 1936, G. S. Fraps, S. E. Asbury, and T. L. Ogier.

"United States Standards for Potatoes," U. S. D. A., Washington, D. C., S. R. A.-B. A. E. 151, Sept. 1936.

"Regulations for Warehousemen Storing Tobacco," U. S. D. A., Washington, D. C., Serv. and Reg. Announcements No. 129 Rev., 1936.

"Regulations of the Secretary of Agriculture under the United States Cotton Standards Act," U. S. D. A., Washington, D. C., Serv. and Reg. Announcements No. 153, Aug. 1936.

Canadian Flax

OTTAWA, Canada.—Two types of flax are produced in Canada. One type is cultivated for the production of fiber as used in the manufacture of linen; the other is grown for the production of flaxseed from which linseed oil is extracted. The flax plant is the source of both these types which are cultivated according to whether the seed or the fiber is the principal product desired. Fiber flax has longer straw and fewer branches and is more suited to moist climates. It is grown chiefly in Ontario and Quebec. The seed flax type has shorter straw, branches freely, and is more suited to a moderately dry, sunny climate. Taking Canada as a whole, from 90 to 97 per cent of the flax produced is grown for seed production and is localized mainly in the central part of Saskatchewan, although flax is grown successfully over a wide area.

An excellent quality of flaxseed for all purposes is grown in the Dominion, the principal consumer being the linseed oil manufacturer who produces two commercial flaxseed products, linseed oil and linseed meal. At present eight mills in Canada use flax.

There is a growing demand for fiber flax from the women's farm circles in the Province of Quebec, which make homespun linens that find a ready sale with tourists.

Winter Cover Crops More Than Rugs For the Soil

FARMERS cooperating with the Soil Conservation Service seeded more acres to cover crops this fall than ever before.

Cover crops, say agronomists of the Service, are more than rugs for rain-worn soils. Wherever cover crops can be seeded on clean, cultivate land, they reduce run-off and check soil erosion. But cover crops do even more—they tend to increase the yields of regular farm crops. Agronomists in the Bureau of Plant Industry found that winter cover crops, such as field peas, vetch, crimson clover, and rye, planted on cotton land, increased cotton yields about one-third and corn yields about three-fourths.

Credit this to cover crops also: They help to keep soluble nitrogen and other plant food in the soil from leaching out and going to waste. They also protect new terraces and terrace outlet channels during the fall and winter when the soil between terraces ordinarily would be bare.

In addition to supplying fall, winter, and early spring pasture, cover crops plowed under add humus to the soil, increasing its fertility and capacity to hold moisture.

Cotton growers usually turn under the cover crops about three weeks before planting, while corn growers ordinarily turn them under about two weeks before seeding.

Excess Soluble Salts in Greenhouse Soils

(*From page* 10)

growth. This was a case where soluble salts developed in pots.

On raised benches or ground beds such flowers as snapdragon, calendula, stock, carnation, and sweet pea may show the unmistakable signs of soluble salts. The growth will be uneven. There will be areas where the growth of the plants is stunted and poor, and in the midst of such areas may be one or more plants that are apparently quite normal. The flowers on these stunted plants are always fewer in number and often smaller in size. One of the reasons for the beneficial effects of hot water treatment on sweet pea soil may be the removal of excess salts by the hot water.

One of the reasons for the injurious effects of steam disinfection of the soil is the accumulation of soluble salts. It is quite possible that the injurious dissolved salts may be present immediately after the treatment. It is equally possible that the steam may have scattered the soluble salts to such an extent that they will not be injurious immediately, but the salts will accumulate in the surface soil later.

According to Professor Connor, the injurious soluble salts are largely nitrates, sulfates, and chlorides. It may be that other acid radicles may act in the same way, but these are the particular forms that Professor Connor found most commonly in his determinations of soluble salts.

The control of this injurious condition in soils is easily accomplished. The salts must be leached from the soil by heavy watering. Six, eight, or even twelve inches of water per square foot of soil will be needed to do this work efficiently. Naturally concomitant with this leaching is good drainage. If this heavy application of water cannot drain readily through the soil, or if a sufficient amount is

not applied to actually pass through the soil, the treatment will not be effective. These excess salts must be actually carried away into the porous subsoil or out into drain tile.

Odd as it may seem, one of the greatest difficulties in controlling this trouble is to impress on the grower just what is meant by heavy watering. Many of them feel that when they have applied water so that it stands on the surface in puddles, that should be sufficient. In many cases it is necessary to urge them to apply what seems to them to be a very heavy watering and then to go back and repeat the application. Ordinarily it is necessary to repeat such applications twice a week, and sometimes this is done every day for a week.

Excess soluble salts are far more common in greenhouses than growers have suspected. Symptoms may be mistaken for deficient nitrates, potash deficiency, and iron deficiency. The Thornton plant-tissue test can be used as the first test for this trouble. Plants so affected will ordinarily be filled with nitrates, phosphates, and potash — but particularly nitrates. When plants have the appearance of needing plant foods and yet show an abundance in the tissues, the presence of soluble salts should be suspected.

Successful Strawberry Practices

(*From page* 17)

row and take root wherever they will, thus forming new plants to produce a heavy crop next season. Of course, where one has set plants very close together and has only a small piece of ground, these runners may be set off, leaving only the parent plant and a few plants close around it to produce berries, but this method is not generally practiced except in Florida and in the small home garden where space is quite limited.

Mulching with pine straw, wheat straw, or other similar material is practiced by nearly all good growers. It is usually applied in January or early February, and at the rate of a ton or more per acre. This is done to hold the berries up off the ground and prevent them from being ruined by grit.

In late August or early September give an application of commercial fertilizer. The same 6-8-6 or 6-8-8 recommended for use before setting is a good one for this purpose. If it is not easy to secure, a 4-8-6 will serve the purpose reasonably well. Scatter it broadcast on top of the plants, covering the whole row and middle with it, and follow immediately with a broom or brush, sweeping the fertilizer off the leaves of the plants so as to get it down on the ground and prevent burning of the leaves. Apply when leaves are dry. Use 500 to 1,000 pounds per acre, or two to four pounds for each 100 feet of row space. Give another application of the same kind and amount of fertilizer in the same way in late fall, say during November or December, because it is during this time of year that the buds are forming which will produce berries the following season.

In the past the most largely planted variety in this section has been the Klondyke. This is largely because it is a berry that is quite firm and ships well. It is not, however, the best variety as far as quality is concerned and is being replaced by the Blakemore and Aroma. Other good varieties are the Premier, Missionary, New Southland, Dorset, Fairfax, Progressive Everbearing, and Gandy.

As soon as the crop of berries is off, work out the old plants and grow new ones for the coming crop. This method of course, does not apply to

the Gulf Coast section where new plants are usually set each year. There are two common methods of doing this, the most common of which is to bar off on both sides of the row, leaving a strip about a foot wide. Then with another turning plow furrow cut off about half of this strip, which turns under the old mother plants, and moves the top of the new row over a few inches from where it was before.

In this turn plow furrow put 500 to 1,000 pounds 6-8-6 or 4-8-6 or 6-8-8 fertilizer. Then run a drag harrow straight across the rows several times to kill grass. This covers the fertilizer and finishes destroying the plowed up plants. This leaves a strip of plants three to six inches wide, and the field looks as if it has been wrecked, but it hasn't. If the plants left are not as vigorous looking as they should be give a top-dressing of 100 to 150 pounds nitrate of soda at this time. Put it right on top of the plants when they are dry. From now on cultivate just as the first year the plants were set, as you are actually growing new plants just as when first started.

The other method of growing a new crop of plants is very similar to the one just outlined. It consists of first running a bull tongue furrow right on top of the row and under old plants, rooting them out. Then run a turning plow furrow 4 to 6 inches to one side of the row, forming a balk. From this time on work as by the other method.

It is usually not desirable to grow new plants from the old ones more than two years, and many good growers say not more than one.

Good Shrubs Result From Good Treatment

(*From page* 15)

or garden supplies. A few extra dollars spent now will save trouble later.

When plantings arrive from the nursery they should be opened and the plants set in water overnight, if planting is done next day. If they are to be held for any length of time, heel in by digging a trench, placing the plants in it, and covering with dirt. When planting, remove only as many plants as you can plant in a short time. Cut off all broken roots with a sharp knife or shears. Wrap the plants in wet burlap while planting. Set the plant in the prepared position (never set closer than 20 inches of the foundation) spreading out the roots, then fill in with good top soil until the hole is half full. Tamp well with the feet and continue to add dirt and tamp until the hole is nearly full. Water copiously and when water has soaked in, fill in the remainder with loose dirt. Tamping and watering, if properly done, will remove any air pockets which would otherwise permit the soil to dry out.

Plants which are moved without "ball and burlap" should have a third to a half of the top wood removed. Cut out all weak stems and prune back the stronger ones. This will help balance the top system and the root system—the latter having been heavily pruned in digging. Plants which are moved with "ball and burlap" do not require such heavy pruning. Even here it is wise to remove any weak stems. The evergreens which are moved this way may have the branches sheared back. Never remove the terminal bud or central leader in spruces and firs, since it disfigures the plant.

Too often, shrubs are forgotten after they are planted and, like "Topsy," just left to grow. It is a marvel that so many survive. Shrubs need cultivation and fertilization after

White fringe, Chionanthus Virginica, grown as a specimen. The flowers are white and make their appearance before the leaves.

planting, just as much as cabbages and tomatoes.

Deciduous shrub beds should be cultivated the first three years, and mulching with leaves and manure will suffice after that. Never cultivate the azalea, rhododendron, mountain laurel, and andromeda, for their roots are close to the surface. Mulch with well-rotted sawdust, acid peat moss, or oak leaves instead. The fine leaved evergreens, such as the junipers, may be cultivated the same as deciduous material.

A Balanced Diet

Plants, like animals, require a proper diet for healthy, normal growth. Like animals, they respond to the proper diet with vigorous, upright stems, leaves of healthy green, and an abundance of flowers. Lack of it results in few flowers, weak stems, and yellow drooping leaves like a dog with the mange. The plant takes its food from the soil and air, and animals exist by feeding upon plants or other animals. Nitrogen, phosphoric acid, and potash are the three elements most needed in a plant's diet, and when combined in a fertilizer, the same is spoken of as a complete fertilizer.

Unfortunately, experimental work with ornamentals has not been conducted on a scale comparable to that with farm crops. That fertilization is necessary is borne out by everyday observation and whatever experimental work that has been done. Experiments by tree experts at Stamford, Conn., and other places show very definite results from the use of complete fertilizers or those containing nitrogen, phosphoric acid, and potash. Nitrogen, as might be expected, is the chief limiting factor. A 6-8-4 fertilizer for trees has been recommended in some instances. This mixture, applied at the rate of a half pound to three pounds per shrub, depending upon the size, will be satisfactory for a majority of shrubs. Where manure is used to mulch the shrubs, nitrogen should be eliminated.

A very good demonstration with trees may be seen on the street in front of my home. They are all American elms of uniform size, planted the same day eight years ago, by the same man. Those which have been fertilized regularly, usually with a 4-12-4 fertilizer, are twice as large today as those which have not been fertilized.

The New Jersey Experiment Station has found that complete fertilizers are beneficial to rhododendron and other

ericaceous plants. However, nitrogen in the mixture must be in the form of ammonia and not free nitrate. In other words, nitrate of soda was not beneficial, but tankage and dried blood gave definite results.

Watch your shrubs and if they are not making an annual growth of 6 to 10 inches, plus a good normal green color in the leaves, something is wrong, and proper fertilization may be your answer. Of course, you will not expect your Old English box to make such a growth, however, it should have a glossy green color.

Controlling Growth

Shrubs should be pruned to remove weak and diseased stems, to remove old wood and force out new growth which bears flowers, and, in the case of hedges, to keep them within bounds. This is very distinct from training, such as topiary or espalier work. Shrubs which need continuous pruning to keep them within bounds should be removed and replaced with those which do not grow so large.

Flowers are borne either on annual wood or wood of the previous year. Abelia grandiflora and P. G. hydrangea are good examples of the first, and azaleas, goldenbells, and most of the spireas, of the second. Heavy winter pruning is all right with those shrubs which bloom on annual wood. Those which bloom on the previous season's growth should be pruned immediately after blooming.

Insects and diseases may cause havoc with shrubs. Healthy shrubs, however, which have been properly planted, fertilized, pruned, and kept in a vigorous condition, are much less apt to suffer injury than those left to grow like "Topsy." San Jose scale, oyster shell scale, bag worms, aphids, caterpillars, and countless others you will have to watch for and control. Your State Agricultural Experiment Station is your surest source of information.

Despite all the trials and tribulations one may have with his shrubs, there is a real joy and pleasure in growing them. Those flame azaleas nurtured for years and now grown to full stature make a gorgeous annual flower show, and so do the rhododendrons, dogwoods, or whatever your personal preference. They compensate for all the trouble and labor expended in growing them.

Good Reasons For Fertilizing Corn

(*From page* 22)

2 inches wide and sprinkled over an area about 6 inches long above the seed, or better, to the sides of the seed. Where the fertilizer is delivered in a small bunch right over the seed, there is apt to be injury to the seed. The germination of the corn is easily affected by too high a concentration of fertilizers."

Most of the corn planter attachments can be adjusted in such a manner that this danger is greatly lessened. Even the oldest types of attachment can be modified to eliminate the danger. A small piece of tin or leather can be wired to the delivery spout of the fertilizer attachment, delivering the fertilizer a little further back to delay the dropping of the fertilizer until some soil has covered the seed.

Chapman points out that there may be danger of the corn burning or firing in dry summers when heavy applications are made. Especially is this true on the sandier soils. On heavier soils, the muck and peat soils, there is less danger of burning from heavier applications during the summer period.

Chapman's experience with fertilizers for corn has shown that year in and year out they have proved themselves a profitable investment.

California Prunes Respond to Potash

(*From page* 20)

To determine the value of both nitrogen and potash in his Burbank sugar-prune orchard, Roy Hatch of Morgan Hill, California, is carrying out a 3-plot test:

Plot 1 (NK) for the past 3 years the annual application has been 2½ pounds of sulphate of ammonia and 1½ pounds of actual potash (K_2O). Plot 2 (N) received 2½ pounds of sulphate of ammonia, but no potash.

Plot 3 (Check) receiving no fertilizer.

The soil on which this test is being conducted is a deep gravelly loam and, from the chemical analysis made, showed a much larger amount of apparently available potash than the two orchards previously mentioned. To prove to his satisfaction that more potash could not be used to advantage, Mr. Hatch decided to carry out the demonstration described.

In 1934 the prunes from Plot 1 (NK) showed improvement in sizes and a slight gain in production over Plot 2 (N), which gain in actual figures amounted to about $16.00 per acre. Nitrogen alone as used in Plot 2 made a very good showing over the check plot, where no fertilizer was used, the gain amounting to about $69.00 per acre. In 1935 the general improvement in production and appearance of his trees from the use of both nitrogen and potash was very apparent, compared with those in the check plot, but since some question

Plot No.	1935 Yields and Values per Acre (base price 2¼c per lb.)		1936 Yields and Values per Acre (base price 3½c per lb.)	
1 (NK)	4,761 (pounds dry)	$233.00	4,986 (pounds dry)	$310.92
2 (N)	3,330 " "	$162.81	3,951 " "	$243.82
3 (Check)			3,213 " "	$196.92

A Santa Clara Valley prune orchard in which potash has been an important part of the fertilizer program.

arose as to the correctness of the returns from the check plot it was decided to omit them in making the 1935 calculations. The only comparisons given are between the returns from Plot 1 receiving both nitrogen and potash and Plot 2 in which nitrogen was the only fertilizer ingredient applied. In 1936 further improvement was apparent, and complete records were kept.

All figures given are based on 90 trees per acre, and values according to sizes which are figured on a market basis price of 2¼c per pound in 1935 and 3½c per pound in 1936.

Mr. Hatch in commenting on the results obtained in this test stated that one need in his sugar-prune orchard was to overcome its tendency to light production. From these tests he seems to have proven that applications of both nitrogen and potash are very important factors in overcoming this trouble. Chemical tests indicate that there is enough available phosphoric acid in this soil to meet present requirements, but within the next few years the higher level of production will necessitate a consideration of the use of phosphates as well.

Permanent Grassland Has Cash Value

(*From page* 8)

dence of the superiority of permanent grassland over a cultivated system in the building up and maintenance of soil organic matter and nitrogen. Even though the grass strips have not been fertilized, the accumulation of organic matter and nitrogen is much greater than even the plot soils which, between 1881 and 1922, have received a total of 123 tons of farm manure in addition to the roots and stubble from the crops of corn, oats, wheat, and hay.

Grass has an additional value in the production of feed units as compared to crops in a grain rotation. The following summary shows the feed units (total digestible nutrients and digestible crude protein) supplied by a 4-year grain rotation and a Kentucky bluegrass pasture. The following results are based on the average of three soils in which the pasture and rotation plots received the same fertilizer treatment.

The above data show that the feeding value of a Kentucky bluegrass pasture exceeds that of a grain rotation. The economic value of the various manurial treatments emphasizes the importance of liberal fertilization.

In 1928, the Pennsylvania Agri-

AVERAGE ANNUAL PRODUCTION OF FEED UNITS (COMPUTED DIGESTIBLE NUTRIENTS) IN EXCESS OF THE UNFERTILIZED PLOT SOILS—POUNDS PER ACRE.

Biennial Plot Treatment	Ky. Bluegrass Pasture Air Dry Matter	Digestible Crude Protein	Total Digestible Nutrients	*Grain Rotation Air Dry Matter	Digestible Crude Protein	Total Digestible Nutrients
P	1,916	232	1,097	1,564	83	1,013
PK	2,491	310	1,419	2,285	121	1,456
NPK	3,443	436	1,944	2,524	124	1,596
P + 6 tons manure	3,133	398	1,779	2,534	130	1,747
Average	2,746	344	1,560	2,227	115	1,453

P = 64 lbs. P_2O_5; K = 50 lbs. K_2O; N = 48 lbs. N as nitrate of soda.

* Including all products of a grain rotation of corn, oats, wheat, and mixed hay.

cultural Experiment Station in co-operation with the U. S. Department of Agriculture, began an extensive pasture experiment on Dekalb soil at Kylertown in 1928. In addition to 24 two-acre grazing plots, there are included several hundred small plots devoted to a detailed fertilizer study. The plan of the experiment includes also 2 fenced-off acres (quadrates) within each 2-acre grazing plot. One-half of each small plot is cut twice during the growing season (designated as hay and aftermath), and the other half is cut at frequent intervals (designated as clippings). The following data show the effect of the two systems of management.

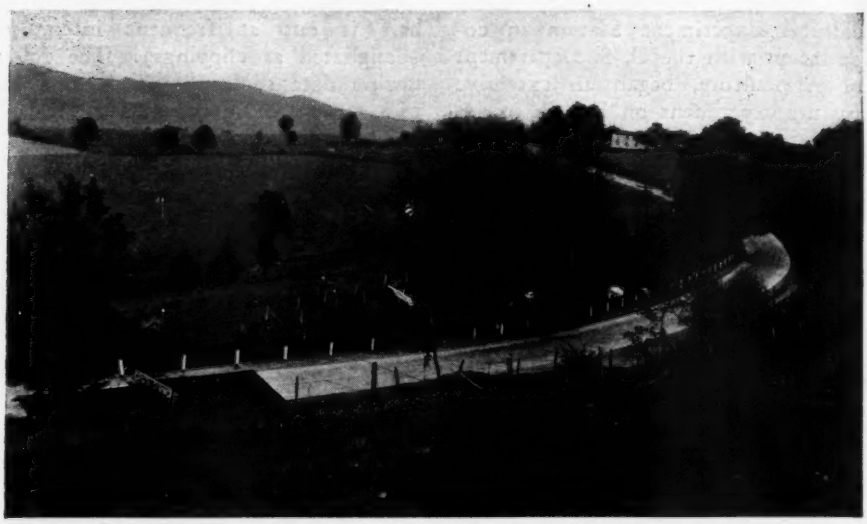
These data show conclusively that frequent cutting (imitation of close grazing) produces less total dry matter but greatly increases the yields of digestible protein and ash content of the grass. The P, K, and N treatments have a very significant value in the increased production of dry matter and the nutritive value of pasture grasses.

Pastural contentment at 9.30 a. m. A well-fertilized pasture approaches very close to the ultimate—"to eat the cake and still have it." Not only does such a pasture produce digestible protein far in excess of an equal area in a grain rotation, but at the same time represents the only economical means of building up and maintaining a high organic matter and nitrogen content of the soil.

CHEMICAL COMPOSITION AND FEEDING VALUE OF MIXED GRASSES AS INFLUENCED BY FREQUENT CLIPPINGS.

	Meadow (2 cuttings) *Fertilizer treatment				Pasture (frequent clipping) *Fertilizer treatment			
	L	L+P	L+PK	L+PKN	L	L+P	L+PK	L+PKN
P_2O_5 (per cent)	0.634	0.694	0.476	0.403	0.561	0.702	0.685	0.626
CaO " "	1.17	0.881	1.05	0.662	1.02	1.23	1.10	0.746
Fat " "	2.39	2.20	2.55	2.47	2.80	2.73	2.76	2.87
Ash " "	5.85	6.30	6.23	5.36	7.43	7.65	7.61	7.13
Feeding value, pounds per acre:								
Digestible protein	66.5	120.2	136.0	198.1	101.5	168.3	185.5	290.1
Digestible nutrients ..	754	1.146	1.240	2.405	710	1,066	1,222	1,897
Total dry matter..	1,290	1,961	2,124	4,131	987	1,490	1,706	2,640

* L = Limestone; P = 64 lbs. P_2O_5; K = 50 lbs. K_2O; N = 48 lbs. N, applied in the early spring and 24 lbs. applied in late summer as sulfate of ammonia. P and K applied biennially. (Bulletin 323, Pennsylvania State College.)



Permanent grassland in Bradford County, Pennsylvania. Soil erosion is at a minimum in this natural grass county, where the dairy industry is highly developed. The following values were obtained there for mineral fertilizers on a Kentucky bluegrass pasture: average annual yields per acre, air-dry bluegrass. P = 1,831; PK = 2,672; and NPK = 4,120 lbs.

Farmers interested in milk or beef production who may object to changes in their present cropping system, as suggested by the New Soil Conservation Program, should be mindful of the following significant fact concerning the value of pasture. To produce a 4-year rotation yielding 61 bushels of corn, 3,166 pounds of stover, 33.3 bushels of oats, 28.3 bushels of wheat, and 3,200 pounds of hay on 4 acres, requires 226 hours of man labor and horse labor at a cost of *$59.61.

On the basis of the above figures, the labor cost necessary to produce 1 ton of digestible crude protein in a grain rotation would be $178.22 as compared to approximately $2.82 from a well-fertilized pasture.

These data dealing with the soil-building properties of grassland and the economic production of feed should convince the most skeptical farmer that changes in his present cropping system, involving seeding-down cultivated fields to permanent grass, is economically sound.

Better Sweet Potatoes For South Carolina

(*From page* 13)

taken to see that seed stock is planted on soil where the crop has not been grown, or where the manure of livestock which have been fed vines or culled potatoes has not been applied for at least 3 years. It is recommended that whenever possible soil that has never been planted to sweet potatoes should be used for growing the seed stock. Successful South Carolina growers this year inspected their seed stock plants during the growing season for diseased hills. Every diseased hill, as well as at least one hill to each side of the diseased hill, was dug and removed from the

* Summary of cost production records in Lancaster Co., Pa., 1921, by E. L. Moffitt and H. S. Sloat, Pa. Extension Service.

field. This largely eliminated stem-end rot or wilt.

Emphasis was placed by the Extension Service upon the production of the market or commercial crop from vine cuttings. Sweet potatoes may be produced either from cuttings or from plants. Vine cuttings are strongly recommended as a precaution against disease. In Louisiana the crop was formerly grown from plants with unsatisfactory results, but now the commercial crop from that state, which is of excellent quality, is produced entirely from vine cuttings.

Suitable Hotbeds

We have found that there are two suitable types of hotbeds, fire-heated beds and manure-heated beds. The value of the fire-heated beds has been thoroughly demonstrated throughout the state during the past 4 years. Early in 1932 the Extension Service drew up and distributed plans for these beds and conducted that year 32 plant-growing demonstrations in the different sections of the state. In these beds 666 bushels of seed stock were bedded and 1,455,900 plants were produced, or an average of 2,186 plants per bushel of seed stock bedded.

These early plants resulting from the hotbeds are set out into a small patch commonly referred to as "the mother patch." This planting produces a supply of vines sufficiently early for transplanting to the commercial field, which enables the growers to produce satisfactory yields. When hotbeds are not used, it is often impossible to get the desired quantity of vines early enough to mature a good crop before frost. With the long growing season that prevails in South Carolina, growers are enabled to employ the method previously mentioned.

More modern methods of harvesting, grading, and packing are now being used by commercial growers in South Carolina. It is still a common sight to see the crop being plowed out of the ground by farm hands, with the pickers following the plows and carelessly throwing the potatoes into piles. Then, after they are dug, one sees them haphazardly tossed into wagons, hauled to storage houses or banks, and thrown into bins. This practice always has and always will result in bruising practically 100 per cent of the potatoes.

Often the harvesting is not done until frost has killed the vines and many potatoes have been injured by the cold. Such handling explains why such tremendous losses result from rotting in storage.

The careful grower who is commercializing his product is most careful in harvesting. The plow or middle-buster is run to avoid cutting the potatoes. Pickers with cotton gloves carefully lay the tubers on the side of the furrow to permit some

An excellent example of the difference between proper and improper handling of sweet potatoes. (Left) Prime. (Right) Ungraded, badly bruised, and rots developing as a result.

drying. Following this operation, the No. 1's are very carefully laid in containers to avoid bruising. These containers are not packed but are barely filled and then hauled to the storage house.

The right temperature in curing is a vital factor in this sweet potato business, and the South Carolina growers who are producing commercially are not neglecting any of the details involved in the curing process and proper storage.

Successful growers are regarding their Porto Ricans before making shipments; in fact the best growers, not satisfied with the U. S. No. 1 potatoes, are actually grading for what might be called prime or the size most highly in demand by merchants and housewives. Formerly bushel tubs were used as containers, but now the bushel crate is being adopted by some growers. Incidentally, the same type of crate is the container used in Louisiana.

In regrading, each potato is carefully handled by graders who wear gloves. The surplus soil is brushed off them and only a clean, uniform-sized, and attractive product is packed.

Inventory

(*From page 5*)

emerged, I do not doubt that the percentage of thinkers and producers of culture hailing from the hay belt would outnumber those from congested areas.

THE sources of culture and new vistas were at one time the chief possession of centers of wealth and population. In this list belong the churches, the clubs, the schools, the libraries, and galleries of art. Whether these were utilized more successfully by those nearest to their portals remains an open question. The answer might best be obtained by a thorough Who's Who of the asylums, prisons, and houses of correction, to determine their occupants' youthful evironment.

We are painfully aware of the imposing grandeur and stained-glass-rosewood attractiveness of the urban altars of soulful inspiration, in bitter contrast to the salvation spots where we were "fetched up." I recall how one of our circle of provincial ministers freely acknowledged that his only object in preaching was a miserable "five hundred a year" and cordwood. It is no pleasure to remember some of the Ichabod Crane types of teachers we suffered under.

We all share memories of the kind of chromo masterpieces that hung on the kitchen walls of yesterday—mostly the art selections of Panrope's hardware emporium in the form of dingy calendars. We also recollect the subscription book of travel craze which went side by side with the men who peddled those globes of wax flowers and the atrocious crayon enlargements from the family album. The demand for these grotesques may not be good proof of rural taste, but just remember they all originated in the cities!

He who thinks these absurd things in any great measure dominate and govern the rural culture of today is probably one who gets his own pet amusement from the comic strips and burlesque comedians. They're about the only places where out-moded and outlandish rubes and customs are on display these days.

We have about as many rural culture clubs as we have townships in some agricultural states. These groups

include homespun heroines who gain solace from the suds in afternoon tea fights, minus the cigarettes. The latter is the main difference between them and their city cousins, for otherwise the jargon of everything "arty" from old masters to surrealism and other do-dad cults sounds much the same. If they fail to swallow it all, what's wrong? One does not step into a scented bath to obtain a drink! So maybe the veneer over their refreshed country skins of thought is just as thick as that secured under the spell of some long-haired celebrity in the snob zone.

Of far more purpose in the farming regions are the community clubs which devote constant study on vital matters of progress and citizenship, and where debate and discussion are encouraged. You will hear as lively repartee in those conclaves as you might in the average city ward.

And then, if it's style and dressmaking you demand as the real index of culture, just attend one of the regular junior achievement days or national club congress pageants. All that I might attempt to say on this score had best be very short, to match my knowledge of wardrobe design, but it's certainly the antithesis of drab and dowdy! And if it's music you want, wake up and hear the bands play at rural high school competitions.

MEASURING country culture by current urban standards is not and never will be the right way for us to get an estimate of the nobler aspirations of the farmer.

This closes the question on any comparative basis, yet it offers new incentives for a richer era of cultural attainment than rural America has yet known. We are already feeling its first effect in nearly all branches of the fine arts; and my hunch is that when agriculture is able to retain its best minds instead of donating them to the cities, our soils will germinate art as well as artichokes and poems as well as potatoes.

Third, let's consider altering "hazardous and uncomfortable." The key to this lies in what do you mean by hazardous? Is it hazardous of yield, income, or environment? We omit the tons of supporting data familiar to most of us and dispose of it thus: Hazardous of yield sectionally and locally? Yes. Hazardous of yield in relation to population requirements? No. Hazardous in returns? Yes, but no worse than for the city worker and with more privileges and benefits than he enjoys. Hazardous in occupational risks or social conditions? Just accept one quote from a recent report by a sociologist after paying a visit to a huge rubber factory. Compare it with the worst country slum you ever saw.

BY Ruth McKenney—"During the third hour you tramp through the pit where tires are cured in huge molds by steam and boiling water. The hot rubber smell is overpowering, the jets of steam hiss and billow out in clouds, and it is damp, sticky, and hot even in December. It is so hot in summer that even the foremen faint. The roar and noise is tremendous, clanking machines and shrieking steam valves. The men wear old pants cut off at the knees, tennis shoes, ragged shirts with no sleeves, open down the front. There is plenty of muscle and speed needed in the pit. The men move in quick, furious motions; they run, not walk at their work. The unhappy man who carries no union card and wears no colored button over his visor leads a life of long misery. His wife is shunned by the neighbors, the children are bullied by the neighbor boys. He himself walks home from the factory full of apprehensions and carefully avoids dark corners and casual saloon conversation. He may expect to have sore feet or broken toes, for the union men who work next to him can be

very careless indeed, and although they apologize when the foreman comes around, they keep right on stamping on his feet or to be more exact, jumping on his feet, with all the energy of a 180-pound rubber worker in A No. 1 condition. There are no neutrals, as non-combatants are scorned on both sides."

AS for creature comforts and conveniences, their possession in the open country could be improved in scope considerably, but our progress in this direction in 10 years has been so marvelous that little criticism need be leveled on the whole. More leisure and better communication are the sources from which come the social, recreational, and aesthetic activities which are the heritage of rural life, but which were so largely lost during the pioneer epoch in America.

Finally, wipe out "querulous and dissatisfied." All there is to this charge is a little funny psychology which artful politicians have magnified. Ever since the settlement of the west, the farmer as a class has been slow to brag, and he has been always braced for a shock. Dealing with the vagaries and harshness of nature, he learned the uncertainty of human expectations. Instead of bowing and yielding, he has dodged. He has never been any too eager to make forecasts. His conservatism has often been regarded as stubbornness. His caution has branded him as a chronic opposer. His prudence has been labeled pessimism. And in the name of all these suppositions and traits, the political machine has used the farmer for its own spoils system, and thereby given him a black eye in the sight of others.

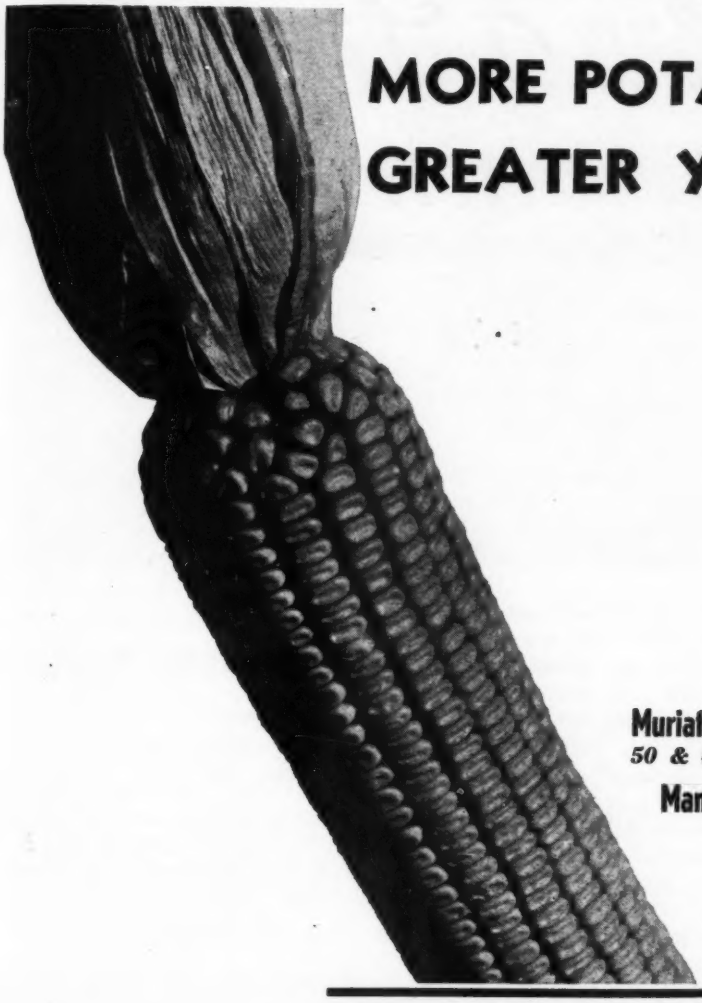
On the contrary, if there are any more patient and long-suffering folk than those who reside in the country and who have raised many generations of good citizens with very few privileges to command, bring them right out and show them off! Instead of being accused of chronic dissatisfaction, the criticism might well be directed at those who so long permitted folks of their own craft to tolerate unfair handicaps without squawking about it.

We do not need to lecture the average farmer on sentiment for his calling. Many of them are too sentimental as it is on some points—often too sentimental for their own welfare. The real task is to get that same feeling he possesses out in the open where other classes can understand its meaning. So far it has been submerged and distorted by concave or convex mirrors, and the clear reflection has seldom come to the surface.

If every farm community could take its grand inventory in terms of achievement, culture, and content, and hand it on to the township and the county groups, and they in turn might assemble such hopeful things in state archives, would we find a better way to educate the public as to the real farm situation?

OF late farmers have been called greedy and class conscious, and others have said they were mere tools for schemers. The drouth has rubbed old sores and exposed inherent weakness in our tenant and credit systems. We know many grubbers call themselves farmers when they are far from it. The national program itself is not definitely directed toward any fixed goal. We are all groping still.

That is why it is a mighty good time to get our house in order. It is a proper time to acquaint America with its patriotic and purposeful farming class, and likewise a fine period to let farmers get some first-hand facts on the urban toilers. We stand in more need of a little national cement than we do hell raising and dynamite.



MORE POTASH-
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TOO BAD

An habitual celebrant crept stealthily into his house one night, but, despite his caution, fell and broke the empty flask he was carrying in his hip pocket. He was sufficiently lucid to realize that first aid should be applied to the cuts which resulted, and accordingly backed up to a mirror and applied a generous dressing of adhesive tape.

As his wife showed no signs of having been awakened, he was no little astonished when she roused him next morning with, "So you came home drunk again last night!"

"Why, my dear, what in the world gave you that idea?"

"If you were sober, will you please explain how the adhesive tape got all over the mirror?"

Salesman, to new car prospect: "Do you prefer a coupe or a sedan?"

Prospect: "I really can't say just now."

Salesman: "I understand. I'm married myself."

WELL, WELL

"Was he shocked over the death of his mother-in-law?"

"Yes, he was electrocuted."

"Faith, Mrs. Casey, you're a woman of wide perception."

"Sure 'tis me own figure and I'll not have ye makin' remarks."

"May I take you home? I like to take experienced girls home."

"But I'm not experienced."

"No, and you're not home yet, either."

First pickaninny: "Gimme some 'lasses."

Second pick: "Don't say 'lasses, say molasses."

First: "How kin I say mo' 'lasses when I ain't had no 'lasses yit?"

HOW NICE

From a church bulletin: "The ladies of the church have cast off clothing of all kinds. They may be seen in the basement of the church any afternoon this week."

A priest offered 25 cents to the boy who could tell him who was the greatest man in history.

"Christopher Columbus," answered the Italian boy.

"George Washington," answered the American lad.

"St. Patrick," shouted the Jewish boy.

"The quarter is yours," said the priest, "but why did you say St. Patrick?"

"Right down in my heart I knew it was Moses," said the Jewish boy, "but business is business."

WHO ENRICHES THE SOIL ENRICHES LIFE

When you smoke a

FINE CIGAR--

Few men realize fertilizer's important contribution to their enjoyment of a fine cigar. Science proves that increasing the NV Sulphate of Potash in tobacco fertilizer not only increases yields and improves quality, but also gives the leaf better flavor and aroma.

Leaf grown to healthy, full-bodied maturity with such fertilizer is prepared to impart all of its choice quality to the smoker because the potash gives it an open grain. This encourages complete combustion. A fine cigar burns with a glow, holds its fire longer and leaves a long white ash.

Leaf from improperly grown, potash-hungry tobacco chars and distills instead of burning. The products of distillation affect the smoke giving it a green, bitter taste.

MORAL: When you smoke a fine cigar give due thanks to the farmer who grew the tobacco. His knowledge of better fertilizers adds to your enjoyment.

POTASH PAYS ON ALL CROPS — NV — POTASH EXPORT MY. — TRADE MARK REG.

A17

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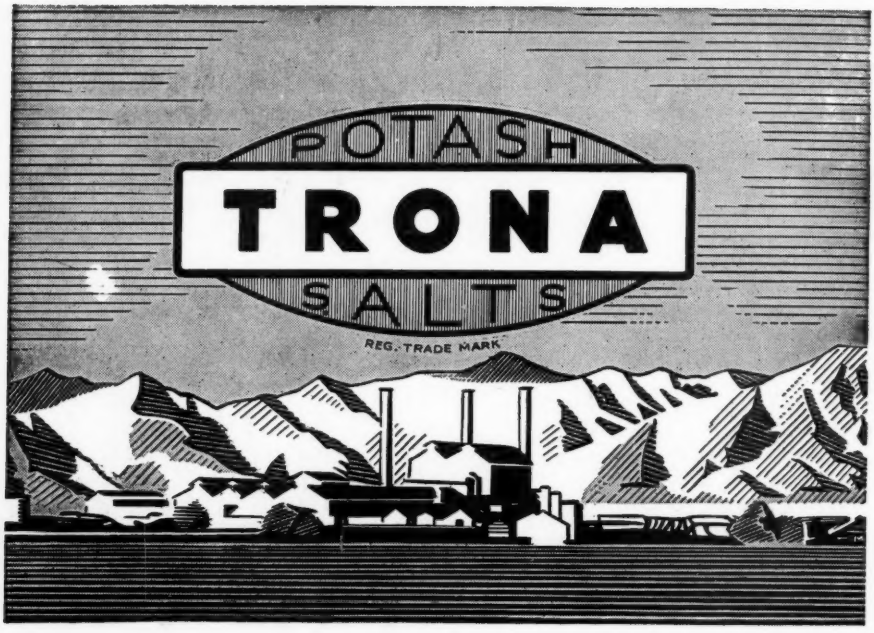

Trona on Searles Lake, California

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